

University of Maribor
Faculty of Natural Sciences and Mathematics

Information on the undergraduate programme
Educational Design with Technology

4.2.2.1 Splošni opis / General description

QUALIFICATION AWARDED

- **Bachelor two-subject programme on “Educational Design with Technology”**

Qualification rewarded: Bachelor in educational design with technology and ...

Duration of studies: 3 years

ADMISSION REQUIREMENTS

Bachelor 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 (40% of the points).

EDUCATIONAL AND PROFESSIONAL GOALS

Basic goals of the programme

The bachelor in educational design with technology and ... will acquire:

- the basic professional knowledge of two subject fields (design with technology and another selected subject), which is important for education of these fields;
- the basic pedagogical, psychological and 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 specific knowledge for further study or work, chosen from the list of elective courses, by a student.

Common competences achieved through the programme

- Ability to understand complex systems for enabling the graduate to include into different interdisciplinary groups;
- ability to search different sources of knowledge in professional problem solving;
- ability to syntetical, analytical and creative thinking and solving problems;
- ability to get critical and self-critical judgement;
- ability of thinking systematically;
- ability of communicating with specialists from other professional and scientific fields;

- information literacy;
- communicating in foreign language;
- knowledge and understanding of social systems (especially processes in education);
- feeling/openness for people and social situations;
- knowledge concerning educational concepts, their philosophical and historical foundations;
- understanding of individual values and restraining professionally-ethical questions.

Subject specific competences achieved through the programme

- Knowledge and understanding of basic technical and technological concepts and their use for explanation of technical phenomena and occurrences in environment;
- controlling of basic practical forms of work and safe using of contemporary manual and machine process technologies of different materials (paper, wood, metals, artificial masses, contemporary composite material, contemporary materials and other natural materials and waste packaging);
- graduates are qualified for system thinking that enables them to integrate into interdisciplinary working groups coping with technological and related scientific, professional and practical problems;
- graduates are qualified for integrating knowledges of different natural sciences;
- understanding of bases of mechanical engineering and activity principles of basic machines devices and their buildings;
- understanding of mechanics and product life cycle;
- knowledge and understanding of descriptive geometry basis and technical drawing with all necessary knowledges, information technologies for interpretation and making of technical drawings;
- understanding of electrotechnics bases and principles of basic activity of electric machines and their buildings;
- qualification for planning, realization and testing of electronic circuits and understanding of their activity;
- using of information – communication technology in the education of technique;
- communicating with specialists from different educational fields;
- fundamental knowledge about educational system on the technical field in different time-frames and educational systems.

ACCESS TO FURTHER STUDIES

Graduates of the bachelor university programme “*Educational Design with Technology*” can continue their studies at the second level leading to the second bologna degree (master degree). Graduates of the master level will be able to continue the studies at the third level, leading to the Doctor degree.

COURSE STRUCTURE DIGRAM WITH CREDITS

Complete curricula of the bachelor university programme “*Educational Design with Technology*” 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 two-subject bachelor programme Educational Design with Technology

1st year, 1st semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ECTS
				L	S	T	LW			
1.	Materials and technologies	obligatory	B. Aberšek	45	10		15	70	110	180/6
2.	Technical drawing	obligatory	S. Glodež	30	10	30		70	110	180/6
3.	Mathematics *	obligatory	J. Vukman	22,5 (45)		15 (30)		37,5 (75)	52,5 (105)	90 (180)/ 3(6) **
Total hours/ ECTS				97,5	20	45	15	177,5	272,5	450/15

* Students of the study programme *Educational Mathematics*, instead of *Mathematics*, choose the *Fundamentals of Computer Science* from the list of basic elective courses of the study programme.

** The course worths 6 ECTS. Each stream contributes 3 ECTS.

1st year, 2nd semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ECTS
				L	S	T	LW			
4.	Engineering design	obligatory	S. Glodež	45	10	15		70	110	180/6
5.	Technology practicum I	obligatory	B. Aberšek		10		60	70	110	180/6
6.	Physics *	obligatory	A. Fajmut	15 (30)	15 (30)		7,5 (15)	37,5 (75)	52,5 (105)	90 (180)/3 (6) **
Total hours/ ECTS				60	35	15	67,5	177,5	272,5	450/15

* Students of the study programme *Educational Physics*, instead of *Physics*, choose the *Chemistry* from the list of basic elective courses of the study programme.

** The course worths 6 ECTS. Each stream contributes 3 ECTS.

2nd year, 3rd semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	T	LW			
7.	Mechanical elements	obligatory	S. Glodež, Z. Ren	45	10	15		70	110	180/6
8.	Electrical engineering	obligatory	N. Muškinja	45	10		15	70	110	180/6
9.	Psychology of development and learning	obligatory	K. Bakračević Vukman	22,5 (45)	7,5 (15)	7,5 (15)		37,5 (75)	52,5 (105)	90 (180)/3 (6)*
Total hours/ ECTS				112,5	27,5	22,5	15	177,5	272,5	450/15

* The course worths 6 ECTS. Each stream contributes 3 ECTS.

2nd year, 4th semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	T	LW			
10.	Energy and energetics	obligatory	B. Aberšek	30	10	15		55	95	150/5
11.	Technology practicum II	obligatory	A. Papotnik		10		45	55	95	150/5
12.	Information and communication technology (ICT)	obligatory	I. Gerlič	15 (30)			15 (30)	30 (60)	30 (60)	60 (120)/2 (4)*
13.	Elective course **	elective		10 (20)	5 (10)			15 (30)	75 (150)	90 (180)/3 (6)
Total hours/ ECTS				55	25	15	60	155	295	450/15

* The course worths 4 ECTS. Each stream contributes 2 ECTS.

** Students choose one elective course with 6 ECTS (3 ECTS belongs to each stream). The elective course can be chosen from the list of elective courses of the study programme *Educational Design with Technology*, from the list of professional elective courses of another study stream or from the list of elective courses of any bachelor study programme on any other home or foreign university. The elective course can be chosen also from the list of basic elective courses of two-subject study programmes of Faculty of Natural Sciences and Mathematics, if the course hadn't been chosen in the 1st year of study.

3rd year, 5th semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	T	LW			
14.	Electronics	obligatory	N. Muškinja	30	10		15	55	95	150/5
15.	Base of planning and production management	obligatory	B. Aberšek	30	10	15		55	95	150/5
16.	Pedagogy	obligatory	M. Pšunder	15 (30)	7,5 (15)			22,5 (45)	37,5 (75)	60 (120)/2 (4)*
17.	Elective course **	elective		10 (20)	5 (10)			15 (30)	75 (150)	90 (180)/3 (6)
Total hours/ ECTS				85	32,5	15	15	147,5	302,5	450/15

* The course worths 4 ECTS. Each stream contributes 2 ECTS.

** Students choose one elective course with 6 ECTS (3 ECTS belongs to each stream). The elective course can be chosen from the list of elective courses of the study programme *Educational Design with Technology*, from the list of professional elective courses of another study stream or from the list of elective courses of any bachelor study programme on any other home or foreign university. The elective course can be chosen also from the list of basic elective courses of two-subject study programmes of Faculty of Natural Sciences and Mathematics, if the course hadn't been chosen in the 1st year of study.

3rd year, 6th semester

Course title		Type of subject	Professor	Range of realization (hours)				Total contact hours	Individual work	Total hours/ ECTS
				L	S	T	LW			
18.	Technology practicum III	obligatory	S. Glodež		10		45	55	95	150/5
19.	Communication and rhetorics for science and technology students	obligatory	B. Aberšek, M. Kordigel-Aberšek	30	15			45	105	150/5
20.	Didactics	obligatory	M. Ivanuš Grmek	15 (30)	7,5 (15)			22,5 (45)	37,5 (75)	60 (120)/2 (4)*
21.	Elective course **	elective		10 (20)	5 (10)			15 (30)	75 (150)	90 (180)/3 (6)
Total hours/ ECTS				55	37,5		45	137,5	312,5	450/15

* The course worths 4 ECTS. Each stream contributes 2 ECTS.

** Students choose one elective course with 6 ECTS (3 ECTS belongs to each stream). The elective course can be chosen from the list of elective courses of the study programme *Educational Design with Technology*, from the list of professional elective courses of another study stream or from the list of elective courses of any bachelor study programme on any other home or foreign university. The elective course can be chosen also from the list of basic elective courses of two-subject study programmes of Faculty of Natural Sciences and Mathematics, if the course hadn't been chosen in the 1st year of study.

Elective Courses

List of basic elective courses of the study programme *Educational Design with Technology*

Course number	Course title	L	S	T	LW	Total contact hours	Individual work	Total hours/ ECTS
1	Modern biology	30	30			60	120	180/6
2	Chemistry	45			30	75	105	180/6
3	Fundamentals of Computer Science	30			45	75	105	180/6
4	Numerical problem solving	30			45	75	105	180/6

List of elective courses of the study programme *Educational Design with Technology*

Course number	Course title	L	S	T	LW /LD	Total contact hours	Individual work	Total hours/ ECTS*
1	Fundamentals of Solid Modelling	20	10			30	150	180/6
2	Dimensioning of machines and devices	20	10			30	150	180/6
3	Computer aided manufacturing	20	10			30	150	180/6
4	Project planning and management	20	10			30	150	180/6
5	Educational competences	20	10			30	150	180/6
6	Basis of professional ethics	20	10			30	150	180/6
7	Creativity in technics and technology	20	10			30	150	180/6
8	Dimensions of Design and Technology attendance and evaluation	20	10			30	150	180/6
9	Computer based Measurement and Control Systems	20	10			30	150	180/6
10	Simulation and modelling	20	10			30	150	180/6
11	Multimedia technologies in education of engineering	20	10			30	150	180/6
12	English for Students of Technology	20	10			30	150	180/6
13	Educational technology	20	10			30	150	180/6

*Common number of ECTS is specified at individual course. Each stream contributes the half.

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.

4.2.2.2 Seznam predavanj / List of Courses

The two-subject bachelor programme Educational Design with Technology

Code	Course title	Type	ECTS*
1	Materials and technologies	O	6
2	Technical drawing	O	6
3	Mathematics	O	3 (6)
4	Engineering design	O	6
5	Technology practicum I	O	6
6	Physics	O	3 (6)
7	Mechanical elements	O	6
8	Electrical engineering	O	6
9	Psychology of development and learning	O	3 (6)
10	Energy and energetics	O	5
11	Technology practicum II	O	5
12	IKT	O	2 (4)
13	Electronics	O	5
14	Base of planning and production management	O	5
15	Pedagogy	O	2 (4)
16	Technology practicum III	O	5
17	Communication and rhetoric for science and technology students	O	5
18	Didactics	O	2 (4)
19	Modern biology	BE	3 (6)
20	Physics	BE	3 (6)
21	Chemistry	BE	3 (6)
22	Mathematics	BE	3 (6)
23	Fundamentals of Computer Science	BE	3 (6)
24	Numerical problem solving	BE	3 (6)
25	Basic concepts of design and technology	BE	3 (6)
26	Fundamentals of Solid Modelling	E	3 (6)
27	Dimensioning of machines and devices	E	3 (6)
28	Computer aided manufacturing	E	3 (6)
29	Project planning and management	E	3 (6)
30	Educational competences	E	3 (6)
31	Basis of professional ethics	E	3 (6)
32	Creativity in technics and technology	E	3 (6)
33	Dimensions of Design and Technology attendance and evaluation	E	3 (6)
34	Computer based Measurement and Control Systems	E	3 (6)
35	Simulation and modelling	E	3 (6)
36	Multimedia technologies in education of engineering	E	3 (6)
37	English for Students of Technology	E	3 (6)

*Common number of ECTS is specified at individual course. Where two values are given, each stream contributes the half.

O obligatory course;
BE basic elective;
E elective course.