University of Maribor
Faculty of Natural Sciences and Mathematics

Information on the degree programme
Mathematics

A) General description

QUALIFICATION AWARDED

- **Undergraduate programme of university studies Mathematics**

Qualification awarded: University degree in Mathematics
Duration of studies: 3 years

ADMISSION REQUIREMENTS

Undergraduate university programme:

a) a successfully completed Matura examination or
b) professional Matura with the fifth subject (which should differ from the professional Matura subjects) or
c) successfully finished secondary school before June 1, 1995.

In case of enrolment limitations, applicants under a) and c) 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).
The applicants under b) are admitted according to their GPA at the professional Matura (20% of the points), their overall GPA in the third and the fourth year of secondary school (20% of the points), their GPA in Mathematics in the third and the fourth year of the secondary school (40% of points) and the GPA at the fifth subject (20% of points).

EDUCATIONAL AND PROFESSIONAL GOALS

The main educational and professional goal is to educate the students in the following fields: analysis, algebra, economics, computer science. All the fields are in accordance with the current employment needs and the envisioned future needs of experts.

The graduates of the undergraduate and the postgraduate study are able to perform their work with the support of up-to-date communicational, informational and computer systems in different fields like mathematics, economy and informatics. So the new possible areas, that can be covered by the graduates of the program Mathematics, lie in actuary, telecommunications and economy.

The main general competences achieved by the graduates at both levels are:
- ability of system thinking, which enables the graduates to integrate themselves into the interdisciplinary groups, which study mathematics in different fields in science, insurance business,
- understanding mathematics and application of this knowledge to other fields,
- solutions of professional work problems, based on the use of scientific methods.

The main specific competences achieved by the graduates at both levels are:
- knowledge and understanding of mathematics,
- knowledge and understanding of basic mathematical concepts and their use to describe the processes in nature,
- understanding and solving basic mathematical problems at the qualitative and quantitative level,
- developed computational skills for problem solving,
- the ability to integrate into project and group work,

- planning of project and group work,
- knowledge of and understanding of impact of mathematics on the development of technology,

ACCESS TO FURTHER STUDIES

Graduates of the undergraduate university programme Mathematics and graduates of any other undergraduate university programme of Mathematics can continue their studies at the postgraduate level leading to the M. Sc. 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 and the post graduate programme of the Mathematics is 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 Mathematics

Mathematics, General Mathematics:

1st year, 1st semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Vectors and matrices	45		45			90	180	270/9
2	Principles of mathematics	30		45			75	135	210/7
3	Elementary functions	30		45			75	135	210/7
4	Fundamentals of computer science and informatics	45			45		90	120	210/7
							330	570	900/30

1st year, 2nd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
5	Analysis I	60		45			105	165	270/9
6	Linear algebra	60		60			120	120	240/8
7	Programming practicum	30			60		90	120	210/7
8	Set theory	45		30			75	105	180/6
							390	510	900/30

2nd year, 3rd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
9	Analysis II	60		45			105	135	240/8
10	Algebra	60		45			105	135	240/8
11	Discrete mathematics I	45		45			90	120	210/7
12	Elective course 1	45		30			75	135	210/7
							375	525	900/30

2nd year, 4th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
13	Analysis III	60		60			120	210	330/11
14	Numerical methods and symbolic mathematics	60		30	30		120	210	330/11
15	Algorithms and data structures	45		15	30		90	150	240/8
							330	570	900/30

3rd year, 5th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
16	Analysis IV	60		45			105	165	270/9
17	Probability	45		30			75	135	210/7
18	Elective course 2	45		30			75	135	210/7
19	Elective course 3	45		30			75	135	210/7
							330	570	900/30

3rd year, 6th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
20	Topology	45		30			90	210	300/10
21	Number theory	45		45			90	210	300/10
22	Elective course 4	45		30			75	135	210/7
24	Diploma seminar						0	90	90/3
							255	645	900/30

Elective Courses

Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
Financial and actuarial mathematics	60		30			90	120	210/7
Physics for mathematicians	45		30	15		90	120	210/7
Geometry	60		30			90	120	210/7
Selected application software	45		30			75	135	210/7
Principles of computer networks	45		30			75	135	210/7
Bases of databases	45		30			75	135	210/7
Programming I	45		30			75	135	210/7
Computer peripheral devices and systems	45		30			75	135	210/7
Plane and solid geomety	45		30			75	135	210/7

Web applications and services	45		30			75	135	210/7
Applied statistics	45		30			75	135	210/7

Mathematics, Applied Mathematics:

1st year, 1st semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
1	Vectors and matrices	45		45			90	180	270/9
2	Principles of mathematics	30		45			75	135	210/7
3	Elementary functions	30		45			75	135	210/7
4	Fundamentals of computer science and informatics	45			45		90	120	210/7
							345	555	900/30

1st year, 2nd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
5	Analysis I	60		45			105	165	270/9
6	Linear algebra	60		60			120	120	240/8
7	Programming practicum	30			60		90	120	210/7
8	Set theory	45		30			75	105	180/6
							390	510	900/30

2nd year, 3rd semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
9	Analysis II	60		45			105	135	240/8
10	Algebra	60		45			105	135	240/8
11	Discrete mathematics I	45		45			90	120	210/7
12	Data Structures	45		30			75	135	210/7
							375	525	900/30

2nd year, 4th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
13	Applied analysis	60		60			120	210	330/11
14	Numerical methods and symbolic mathematics	60		30	30		120	210	330/11
15	Algorithms	45		45			90	150	240/8
							330	570	900/30

3rd year, 5th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
16	Probability	60		45			105	165	270/9
17	Elective course 1	45		30			75	135	210/7
18	Elective course 1	45		30			75	135	210/7
19	Elective course 2	45		30			75	135	210/7
							330	570	900/30

3rd year, 6th semester

Course number	Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
20	Applied statistics	45		30	15		90	120	210/7
21	Financial and actuarial mathematics	60		30			90	120	210/7
22	Elective course 3	45		30			75	135	210/7
24	Diploma seminar						0	90	90/3
							255	645	900/30

Elective Courses

Course title	L /EL	S	T	LW	FW	Total contact hours	Individual work	Total hours/ ECTS
Analysis IV	60		45			105	105	210/7
Physics for mathematicians	45		30	15		90	120	210/7
Geometry	60		30			90	120	210/7
Selected application software	45		30			75	135	210/7
Principles of computer networks	45		30			75	135	210/7
Bases of databases	45		30			75	135	210/7
Programming I	45		30			75	135	210/7
Computer peripheral devices and systems	45		30			75	135	210/7
Plane and solid geomety	45		30			75	135	210/7
Web applications and services	45		30			75	135	210/7

Number theory	45		45			90	120	210/7
Topology	45		30			75	135	210/7

FINAL EXAMINATION

There is no final examination other than the bachelor thesis. There is a final examination before the master thesis.

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 ob 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.

The diploma work is presented publicly before an examination board composed of the Head of the Chair, the diploma work mentor and co-mentor.

ECTS DEPARTMENTAL CO-ORDINATOR

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

Information on the degree programme Mathematics

B) List of Courses

Undergraduate university programme Mathematics

Mathematics, General Mathematics:

Code	Course title	Type	ECTS
	Algebra	O	8
	Algorithms and data structures	O	8
	Analysis I	O	9
	Analysis II	O	8
	Analysis III	O	11
	Analysis IV	O	9
	Applied statistics	E	7
	Bases of databases	E	7
	Computer peripheral devices and systems	E	7
	Diploma seminar	O	2
	Discrete mathematics I	O	7
	Elementary functions	O	7
	Financial and actuarial mathematics	E	7
	Fundamentals of computer science and informatics	O	7
	Geometry	E	7
	History of mathematics	E	7
	Linear algebra	O	8
	Number theory	O	7
	Numerical methods and symbolic mathematics	O	11
	Physics for mathematicians	E	7
	Plane and solid geomety	E	7
	Principles of computer networks	E	7
	Principles of mathematics	O	7
	Probability	O	7
	Programming I	E	7
	Programming practicum	O	7
	Selected application software	E	7
	Set theory	O	6
	Topology	O	7
	Vectors and matrices	O	9
	Web applications and services	E	7

O … obligatory course E … elective course

Mathematics, Applied Mathematics:

Code	Course title	Type	ECTS
	Algebra	O	8
	Algorithms	O	8
	Analysis I	O	9
	Analysis II	O	8
	Applied analysis	O	11
	Applied statistics	O	7
	Bases of databases	E	7
	Computer peripheral devices and systems	E	7
	Data Structures	O	7
	Diploma seminar	O	2

	Discrete mathematics I	O	7
	Elementary functions	O	7
	Financial and actuarial mathematics	O	7
	Fundamentals of computer science and informatics	O	7
	History of mathematics	E	7
	Linear algebra	O	8
	Number theory	E	7
	Numerical methods and symbolic mathematics	O	11
	Physics for mathematicians	O	7
	Plane and solid geomety	E	7
	Principles of computer networks	E	7
	Principles of mathematics	O	7
	Probability	O	9
	Programming I	E	7
	Programming practicum	O	7
	Selected application software	E	7
	Set theory	O	6
	Topology	E	7
	Vectors and matrices	O	9
	Web applications and services	E	7

O … obligatory course E … elective course