

University of Maribor
Faculty of Natural Sciences and Mathematics

**Information on the postgraduate
doctoral programme:**

Mathematics

General description

QUALIFICATION AWARDED

- **Doctoral programme “Mathematics”**

Qualification rewarded: doktor znanosti

Duration of studies: 3 years

visokošolski strokovni študijski program, sprejet pred 11.6.2004, in študijski program za pridobitev specializacije; tem kandidatom se pred vpisom v dani študijski program na predlog Oddelka za matematiko in računalništvo FNM individualno določijo dodatne študijske obveznosti v višini 45 ECTS - 4 izpiti iz ožjih področij matematične analize, algebre in diskretne matematike, geometrije in topologije ter verjetnosti in statistike.

ADMISSION REQUIREMENTS

- Successfully completed second stage university programme (assessed with 300 ECTS);
- Successfully completed graduate university programme, accepted before the enforcement of the Higher Education Act of 11th June 2004;
- Successfully completed high school programme, accepted before the enforcement of the Higher Education Act of 11th June 2004, and a programme of specialization - these applicants are required to pass additional evaluation, individually defined by the Dept. of Math and Comp. Sci. in a total amount of 45 ECTS (consisting of 4 exams from some subfield of mathematical analysis, algebra with discrete structures, geometry with topology and probability with statistics);
- Successfully completed programme, leading to a profession subject to EU regulations or another master program assessed with 300 ECTS.

TRANSFER REQUIREMENTS

Students of other third stage university programmes in Mathematics can enter this programme if they fulfil the entrance conditions and there are enough vacancies. The work of the student in the previous programme is evaluated on the basis of official documents issued by the authorities of the applicants' university and the exams that he/she still has to pass are defined by the Department of mathematics and computer science.

According to the rules of transfer to the second year of doctoral study in mathematics, a candidate can apply if

- he/she has successfully completed a master of science programme, accepted before the enforcement of the Higher Education Act of 11th June 2004; in this case the applicants' previous study will be evaluated by at least 60 ECTS points.
- or he/she has successfully completed a graduate university programme, accepted before the enforcement of the Higher Education Act of 11th June 2004 and a programme of specialization; in this case the applicants' previous study will be evaluated by at least 60 ECTS points.

EDUCATIONAL AND PROFESSIONAL GOALS

Basic goals of the programme

- Hand on the deepened knowledge of mathematics and introduce wideness, role, meaning and interdisciplinary of the represented field to the students;
- give them the necessary organizational and professional knowledge about development and research in the field of mathematics;
- qualify students for using the methods and working technics, following the professional developing trends in the field of mathematics and its applications;
- qualify students for independent planning of education process and professional development of specific mathematical subject;
- perform the newest teaching methods and make students familiar with modern trends of using learning technologies in mathematics;
- deepen the theoretical knowledge and develop methodological knowledge for solving exact technical, technological, organizational and developing tasks and projects in the area of mathematics;
- qualify students for independent international competition in mathematics research and education on all levels.

Common competences achieved through the programme

- Ability of thinking systematically;
- ability to get critical and self-critical judgement;
- ability and readiness for team work in domestic and international environment;
- ability to use the theory in problem solving;
- improved knowledge of experimental and other methods for proving the scientific theories;
- ability to search different sources of knowledge in professional problem solving;
- ethical reflection and professional ethic standard commitment in mathematics and mathematical education;
- initiative and independence in decision-making and the maintenance of professional and scientific projects.

Subject specific competences achieved through the programme

- Profound knowledge about mathematics in different time-frames and educational systems;
- knowledge about the individual and team research work in mathematics;
- ability to present the results of scientific research on the scientific or professional conferences and journals as well;
- to use the information – communication technologies in mathematics;
- the ability to classify the scientific research methods into the concepts and models of educational process in mathematical subjects at all level of education;
- improved knowledge of project work and its presentation;
- managing qualitative research in mathematics;

- managing statistical methods in mathematics;
- managing methodology of planning, supervision and evaluating results and achievements at research work.

ACCESS TO FURTHER STUDIES

Doctoral university programme Mathematics is a supreme degree of university study in the area of mathematics.

COURSE STRUCTURE DIGRAM WITH CREDITS

Complete curricula in the doctoral programme Mathematics is given on 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.

Doctoral Programme “Mathematics”

The postgraduate doctoral programme consists of:

- 2 obligatory courses (10 ECTS each) from the given list,
- 2-4 courses on choice (20 ECTS all together) from the selection of the available subjects,
- 3 obligatory seminars (20 ECTS all together) for the selection of the subject of the doctoral thesis and for its presentation,
- individual research work (90 ECTS),
- composition and defence of the doctoral thesis (30 ECTS)

in total summ of 180 ECTS.

The abbreviations in the curriculum have the following meaning:

C – total contact hours / **L** – lectures / **W** – independent work

Course title or activity	1 st Year				
	1 st semester				
	L	W	C	Total hours	ECTS
Obligatory course 1	60	240	60	300	10
Course(s) on choice 1	60 or (30+30)	240	60	300	10
Research Seminar 1		280	20	300	10
Total semester	120	760	140	900	30
	2 nd semester				
	L	W	C	Total hours	ECTS
Obligatory course 2	60	240	60	300	10
Individual research work 1		595	5	600	20
Total semester	60	835	65	900	30
Total year	180	1595	205	1800	60

Course title or activity	2 nd Year				
	3 rd semester				
	L	W	C	Total hours	ECT S
Research Seminar 2		130	20	150	5
Individual research work 2		745	5	750	25
Total semester		875	25	900	30
	4 th semester				
	L	W	C	Total hours	ECT S
	L	W	C	Total hours	ECT S
Course(s) on choice 2	60 or (30+30)	240	60	300	10
Individual research work 3		595	5	600	20
Total semester	60	835	65	900	30
Total year	60	1710	90	1800	60

Course title or activity	3 rd Year				
	5 th semester				
	L	W	C	Total hours	ECT S
Research Seminar 3		130	20	150	5
Individual research work (IRW)		745	5	750	25
Total semester		875	25	900	30
	6 th semester				
	L	W	C	Total hours	ECT S
	L	W	C	Total hours	ECT S
Doctoral Dissertation, Publication of scientific paper ¹		875	25	900	30
Total semester		875	25	900	30
Total year		1750	50	1800	60

¹According to the University Statute, the student can not be awarded the degree of Doctor before the Doctoral Dissertation is defended and publication(-s) in a peer reviewed scientific journal is(are) at least accepted for print.

FINAL EXAMINATION

There is no final examination other than the defence of the doctoral thesis.

EXAMINATION AND ASSESSMENT 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 the successful completion of the written exam and the seminar work where required. In individual work, the student's successful start, one third-, two third-accomplishments and finishing of the investigations are assessed. Timetables of examinations are issued individually in a consense between the student and the lecturers. Otherwise,

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 literature and other items during the examination is determined by the lecturer and may vary from course to course.

The Ph.D. thesis is publicly presented and defended before an examination board, chaired by an internationally recognized academician, who is an expert in the field. The members of the board are also the Dean of the Faculty, the mentor, co-mentor and one or two internationally recognized academicians, who are experts in the field.

ECTS DEPARTMENTAL COORDINATOR

ECTS departmental coordinator is the actual head of the department.

List of Courses

No.	Course title	The type of course (O-obligatory, C-on choice)	ECTS
Main/general subjects			
1.	Algebra	O/C	10
2.	Discrete mathematics	O/C	10
3.	Funkcional analysis	O/C	10
4.	Topology	O/C	10
5.	Probability and statistics	O/C	10
6.	Financial mathematics	O/C	10
7.	Computer mathematics	O/C	10
Specific subjects			
8.	Selected topics from algebra	C	5
9.	Selected topics from discrete mathematics	C	5
10.	Selected topics from funkcional analysis	C	5
11.	Selected topics from topology	C	5
12.	Selected topics from probability and statistics	C	5
13.	Selected topics from financial mathematics	C	5
14.	Selected topics from computer mathematics	C	5
The preparation of doctoral thesis			
15.	Research Seminar 1	O	10
16.	Research Seminar 2	O	5
17.	Research Seminar 3	O	5
Individual research work			
18.	Individual research work 1 - 4	O	90
The doctoral thesis			
19.	Composition and defence of the doctoral thesis	O	30