

Mathematics undergraduate study programme, first Bologna cycle

COURSE STRUCTURE of the study programme

The study programme consists of 21 compulsory courses and nine elective courses. Elective courses are divided into internal and external electives. Upon enrolment in the third year, students select a study track (further details are provided below). Students complete the programme once they have fulfilled their final academic requirement and accumulated a total of 180 ECTS under the European Credit Transfer and Accumulation System (ECTS).

All courses in the study programme carry 6 ECTS.

The following section presents the structure of the study programme by year, as well as the compulsory and internal elective courses and the available study tracks.

Table 1: Structure of the study programme

Year of study	Study obligation	Number	ECTS-credits (ECTS)	
			ECTS	ECTS/Year of study
1.	Compulsory Course	10	60	60
2.	Compulsory Course	8	48	60
	Internal Elective Course	1	6	
	External Elective Course	1	6	
3.	Compulsory Course	2	12	60
	Internal Elective Course	6	36	
	External Elective Course	2	12	

Legend:

ECTS credits (ECTS) = credit points awarded under the European Credit Transfer and Accumulation System (ECTS). The credit system facilitates student mobility and the mutual recognition of completed academic requirements.

ECTS credits represent an average estimate of the time required to complete a course and include both organized forms of instruction (lectures, seminars, seminar and laboratory exercises, fieldwork, practical training, etc.) and the student's independent work (exam preparation and other course-related obligations, etc.). One (1) ECTS credit corresponds to 25 to 30 hours of study workload. Credits are awarded upon the successful completion of the requirements for an individual course.

Table 2: First year of study

No.	Course	ECTS
1.	Algebra I - Matrix Calculus	6
2.	Algebra II – Linear Algebra	6
3.	Analysis I – Foundations of Analysis	6
4.	Analysis II – Infinitesimal Calculus	6
5.	Discrete Mathematics II – Combinatorics	6
6.	Mathematical Practicum I	6
7.	Computer Practicum	6
8.	Computer Science I	6
9.	Discrete Mathematics I – Set Theory	6
10.	Mathematical Topics in English I	6

Table 3: Second year of study

No.	Course	ECTS
1.	Algebra III – Abstract Algebra	6
2.	Analysis III – Functions of Many Variables	6
3.	Physics	6
4.	Introduction to Numerical Calculations	6
5.	Computer Science II	6
6.	Probability	6
7.	Algebra IV - Algebraic Structures	6
8.	Analysis IV - Real Analysis	6
9.	Internal Elective Course I	6
10.	External Elective Course I	6

Table 4: Third year of study

No.	Course	ECTS
1.	Mathematical Modelling	6
2.	Statistics	6
3.	Internal Elective Course II	6
4.	Internal Elective Course III	6
5.	Internal Elective Course IV	6
6.	Internal Elective Course V	6
7.	Internal Elective Course VI	6
8.	Internal Elective Course VII	6
9.	External Elective Course II	6
10.	External Elective Course III	6

ELECTIVE courses

Elective courses are selected by students in the second and third year of study.

Out of the seven *internal elective courses*, students must select at least five mathematics courses. Among these, at least four must be chosen from the block corresponding to the selected study track. An exception applies to the General Mathematics track, where no such restrictions apply - students may select any five mathematics courses from the seven internal elective courses. Further information on study tracks is provided below.

Within the framework of internal electives, students may also select courses from the fields of [Computer science](#), as well as [Mathematics in Economics and Finance](#). Four courses from the undergraduate university study programme Mathematics in Economics and Finance are considered mathematics courses, namely: Fundamentals of Insurance, Financial Mathematics, Stochastic processes I, Game Theory.

Table 5: Internal Elective Courses

No.	Course	ECTS
1.	Algebraic Graph Theory	6
2.	Differential Equations	6
3.	Functional Analysis	6
4.	Galois Theory	6
5.	Geometry	6
6.	Selected Topics in Discrete Mathematics	6
7.	Selected Topics in Statistics	6
8.	Combinatorics	6
9.	Complex Analysis	6
10.	Cryptography and Computer Safety	6
11.	Mathematical Topics in English II	6
12.	Mathematics: Methods and Art	6
13.	Molecular Modelling	6
14.	Optimization Methods	6
15.	Optimization Methods in Logistics	6
16.	Permutation Groups	6
17.	Seminar - Introduction to Research Work	6
18.	Symmetric-key Cryptography	6
19.	Graph Theory	6
20.	Coding Theory	6
21.	Measure Theory	6
22.	Number Theory	6
23.	Topology	6
24.	History and Philosophy of Mathematics	6

Table 5 lists *all internal elective courses* accredited within the Mathematics study programme. However, UP FAMNIT *offers only a selection of elective courses* from the broader pool each academic year. In doing so, the faculty takes into account its staffing and financial capacities, as well as student interest in individual courses. The final list of elective courses offered to students for the upcoming academic year is published prior to the start of enrolment for that year.

External elective courses may be selected within accredited study programmes at higher education institutions in Slovenia or abroad. Students may also choose external elective courses from the pool of internal elective courses.

Within the framework of external electives in the third year, students may complete Practical Training in a Work Environment (lasting three weeks and carrying 6 ECTS credits). The purpose of this training is to enable students to gain professional experience in the field of mathematics. The training is carried out in a real work environment under the supervision of a qualified mentor in mathematics. Students who choose to undertake practical training must first coordinate with the study programme coordinator and then record their decision on the enrolment form when enrolling in the third year. More detailed instructions are available in the section [Practical Training](#).

STUDY fields

Students select their study track upon enrolment in the third year.

The study programme offers seven tracks: Discrete Mathematics, Financial Mathematics, Cryptography, Computer intensive methods and applications, Statistics, General Mathematics, Theoretical Mathematics.

The rule regarding internal elective courses is that each student, regardless of the selected field, must choose at least five mathematics courses out of the seven internal elective courses. Among these, at least four must be selected from the block (set) of courses corresponding to the chosen field. An exception applies to the General Mathematics track, for which no specific block of courses is defined; students may select any five mathematics courses from the seven internal elective courses.

The course blocks for each study track are as follows:

- DISCRETE MATHEMATICS field: *Algebraic Graph Theory, Selected Topics from Discrete Mathematics, Finite Geometries, Optimization Methods, Graph Theory*;
- FINANCIAL MATHEMATICS field: *Financial Mathematics, Programming III Concurrent Programming, Game Theory*;
- CRYPTOGRAPHY field: *Cryptography and Computer Safety, Symmetric Codes, Coding Theory, Number Theory*;
- COMPUTER INTENSIVE METHODS AND APPLICATIONS field: *Differential Equations, Molecular Modelling, Introduction to Bioinformatics*;
- STATISTICS field: *Combinatorics, Programming III Concurrent Programming, Selected Topics from Statistics, Stochastic Processes*;
- THEORETICAL MATHEMATICS field: *Functional Analysis, Permutation Groups, Number Theory, Topology*.

For assistance and guidance in selecting elective courses and fields of study, students may consult the study programme coordinator.

Contact:

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