UCLouvain

MATH1BA

2024 - 2025

Bachelor in Mathematics

At Louvain-la-Neuve - 180 credits - 3 years - Day schedule - In French
Dissertation/Graduation Project : **NO** - Internship : **NO**
Activities in English: **YES** - Activities in other languages : **NO**
Activities on other sites : **NO**
Main study domain :

MATH1BA - Introduction

Introduction

Introduction

You love mathematics.

You want to learn to reason rigorously and critically.

You want to develop your creativity to solve problems, model and visualize complex situations, drawing on modern digital tools and a rich, solid mathematical tradition.

You have a good sense of argumentation and want to communicate your ideas in a faithful, accessible and attractive way.

UCLouvain offers you a training program that will enable you to acquire the skills needed to :

- develop and apply cutting-edge mathematics,
- transmit mathematical knowledge to a variety of audiences,
- support decision-making through rational data analysis.

Your profile

A solid background in mathematics, such as a strong mathematics option in secondary education, is highly recommended for mathematics studies. It is also important to have a good general scientific and technological culture, a good command of the French language and a good knowledge of English.

Your future job

Mathematicians are active in many fields where mathematics interacts with other disciplines: chemical and pharmaceutical industries, insurance, finance and actuarial science, consulting, modeling, systems planning and optimization, computer and data sciences, artificial intelligence, cryptography and computer security, astronomy, weather forecast, climate science, ecology and more.

Mathematicians share their passion for mathematics as teachers in upper secondary and higher education.

Mathematicians also contribute to mathematical research. They develop our understanding of the world by introducing new concepts, tools and constructions, and by studying them rigorously. They identify and implement the concepts and tools needed to solve mathematical problems of importance to our society, our economic activity or the development of other scientific disciplines.

Your programme

The Bachelor of Mathematical Sciences program consists of 180 credits.

The 150 general training credits cover

- Fundamental mathematics: algebra (linear algebra, group theory, commutative algebra, etc.), geometry (affine geometry, vector geometry, differential geometry, topology) and analysis (functions of several variables, complex analysis, measure theory, differential equations and functional analysis).
- Applied mathematics: probability, data analysis and inferential statistics, numerical analysis and computer programming,
- Other scientific disciplines, including physics, chemistry, biology, earth science and economics.

The program offers the possibility of selecting certain courses to focus more on fundamental or applied mathematics. The main language of instruction is French, with a few courses in English and English courses for scientists.

The training is based on progressive learning and a program that allows time for high-quality personal work, with high-quality close supervision: exercise sessions, laboratories, group or individual work, tutorials and the opportunity to carry out initial personal research under the guidance of a teacher.

The 30-credit minor allows you to go deeper in training in mathematics or statistics and data science. Other minor choices allow you to develop skills in related disciplines (physics, computer science, economics and management, philosophy) or to open up to other disciplines.

Your parcours

At the end of the bachelor's program, students will have acquired the disciplinary foundations needed for further studies with :

- A master's degree in mathematics
- A master's degree in mathematics education
- In the fields of statistics and data science : A Master's degree in actuarial science / A Master's degree in data science, with an emphasis on statistics / A Master's degree in statistics, general orientation / A master's degree in statistics, with a focus on biostatistics (after taking or adding 3 biology credits).

All these Master's degrees are accessible regardless of the choice of minor. Other master's degrees are available under certain conditions.

MATH1BA Programme

Detailed programme by subject

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
- Offered in 2024-2025 but not the following year
- Not offered in 2024-2025 or the following year
- Activity with requisites
- Open to incoming exchange students
- Not open to incoming exchange students

[FR]

				Year 1	2	3
Probabilités et statistiques (16 credits)						
LMAFY1101	Data exploration and introduction to statiscal inference	Anouar El Ghouch	FR [q2] [30h+30h] [5 Credits]	x		
LMAT1271	Calculation of probability and statistical analysis	Rainer von Sachs	FR [q2] [30h+30h] [6 Credits] *> English-friendly*		x	
LMAT1371	Probability Theory	Karim Barigou	FR [q2] [30h+22.5h] [5 Credits]			x
Séminaires et travaux de synthèse (6 credits)						
LMAT1381	Personal project and seminary	Marino Gran Augusto Ponce	FR [q2] [30h] [6 Credits] *> English-friendly*			x
Anglais (9 credits)						
LANG1861	English: reading and listening comprehension of scientific texts	Catherine Avery (coord.) Fanny Desterbecq Amandine Dumont (coord.) Marc Piwnik	EN [q2] [10h] [3 Credits]			

Data explo

				Year 1	2	3
LTECO2300	Societies, cultures, religions : Ethical questions	Marcela Lobo Bustamante	FR [q1] [15h] [2 Credits]			x

Bloc au choix

List of available minors

Students can choose to study certain aspects of their bachelor's degree in greater depth:

- Additional module in mathematics
- Additional module in statistics and data science.

They can also choose to develop their skills in related disciplines:

- Minor in physics
- Minor in applied mathematics
- Minor in computer science
- Access minor to master's degree in economics
- Minor in management ("Initiation")
- Minor in Philosophy

Student choose from the list below of the most commonly programmed minors for mathematicians, or apply for access to one of the UCLouvain minors in the full list (https://uclouvain.be/fr/etudier/mineures.html), taking into account any admission requirements.

> Additionnal module in Mathematics *[en-prog-2024-appmath]*
> Approfondissement en statistique et sciences des données *[en-prog-2024-appstat]*
> Minor in Culture and Creation *[en-prog-2024-mincucrea]*
> Minor in Scientific Culture *[en-prog-2024-mincults]*
> Minor in Development and Environment *[en-prog-2024-mindenv]*
> Minor : Issues of Transition and Sustainable Development (*) *[en-prog-2024-mindd]*
> Minor in Economics *[en-prog-2024-minecon]*
> Minor in Gender Studies *[en-prog-2024-mingenre]*
> Minor in Geography *[en-prog-2024-mingeog]*
> Minor in Mangement (basic knowledge) *[en-prog-2024-minogest]*
> Minor in Computer Sciences *[en-prog-2024-minsinf]*
> Minor in Philosophy *[en-prog-2024-minfilo]*
> Minor in entrepreneurship (*) *[en-prog-2024-minmpme]*
> Minor in Economics (open) *[en-prog-2024-minoeco]*
> Minor in Physics *[en-prog-2024-minphys]*
> Minor in numerical technologies and society *[en-prog-2024-minstic]*
> Minor in Applied Mathematics *[en-prog-2024-lminomap]*
> Minor in Mechanics *[en-prog-2024-lminomeca]*
> Mineure Polytechnique *[en-prog-2024-minpoly]*

(*) This programme is the subject of access criteria

Sciences humaines

Philosophie

L'étudiant choisit
From 2 to 4credit(s)

⛒ LSC1120A	Philosophy	Charles Pence	FR [q1] [45h] [2 Credits]
⛒ LFILO1250A	Logic (partim)	Peter Verdée	FR [q2] [45h] [4 Credits] > *English-friendly*

Bloc au choix

L'étudiant complète son programme en choisissant des cours des 2 blocs suivants (il est conseillé à l'étudiant de s'inscrire à au moins 10 crédits par bloc annuel). Cependant, avoir suivi tous les cours du bloc Statistique et Informatique est recommandé si vous souhaitez vous inscrire au master en science des données, orientation statistique.

⛒ Bloc Mathématique

MATH1BA - 3RD ANNUAL UNIT

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
- Offered in 2024-2025 but not the following year
- Not offered in 2024-2025 or the following year
- Activity with requisites
- Open to incoming exchange students
- Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Majeure

Analyse

- LMAT1321

⊠ LTECO2300	Societies, cultures, religions : Ethical questions	Marcela Lobo Bustamante	FR [q1] [15h] [2 Credits]

⊙ Bloc au choix

L'étudiant complète son programme en choisissant des cours des 2 blocs suivants (il est conseillé à l'étudiant de s'inscrire à au moins 10 crédits par bloc annuel). Cependant, avoir suivi tous les cours du bloc Statistique et Informatique est recommandé si vous souhaitez vous inscrire au master en science des données, orientation statistique.

⊠ Bloc Mathématique

MATH1BA - Information

Access Requirements

Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.
The admission requirements must be met prior to enrolment in the University.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

General access requirements

Except as otherwise provided by other specific legal provisions, admission to undergraduate courses leading to the award of a Bachelor's degree will be granted to students with one of the following qualifications :

1. A Certificate of Upper Secondary Education issued during or after the 1993-1994 academic year by an establishment offering full-time secondary education or an adult education centre in the French Community of Belgium and, as the case may be, approved if it was issued by an educational institution before 1 January 2008 or affixed with the seal of the French Community if it was issued after this date, or an equivalent certificate awarded by the Examination Board of the French Community during or after 1994;

2. A Certificate of Upper Secondary Education issued no later than the end of the 1992-1993 academic year, along with official documentation attesting to the student's ability to pursue higher education for students applying for a full-length undergraduate degree programme;

3. A diploma awarded by a higher education institution within the French Community that confers an academic degree issued under the above-mentioned Decree, or a diploma awarded by a university or institution dispensing full-time higher education in accordance with earlier legislation;

4. A higher education certificate or diploma awarded by an adult education centre;

5. A pass certificate for one of the entrance examinations organized by higher education institutions or by an examination board of the French Community; this document gives admission to studies in the sectors, fields or programmes indicated therein;

6. A diploma, certificate of studies or other qualification similar to those mentioned above, issued by the Flemish Community of Belgium, the German Community of Belgium or the Royal Military Academy;

7. A diploma, certificate of studies or other qualification obtained abroad and deemed equivalent to the first four mentioned above by virtue of a law, decree, European directive or international convention;

Note:

Requests for equivalence must be submitted to the Equivalence department (Service des équivalences) of the Ministry of Higher Education and Scientific Research of the French Community of Belgium in compliance with the official deadline.

The following two qualifications are automatically deemed equivalent to the Certificate of Upper Secondary Education (Certificat d'enseignement secondaire supérieur – CESS):

- European Baccalaureate issued by the Board of Governors of a European School,

- International Baccalaureate issued by the International Baccalaureate Office in Geneva.

8. Official documentation attesting to a student's ability to pursue higher education (diplôme d'aptitude à accéder à l'enseignement supérieur - DAES), issued by the Examination Board of the French Community.

Specific access requirements

- Access to bachelor programmes for candidates of nationality outside the European Union who are not assimilated to Belgian nationals is subject to the following criteria:
  - not have obtained a secondary education diploma for more than 3 years maximum. Example: for an admission application for the academic year 2024-2025, you must have obtained your diploma during the academic years 2021-2022, 2022-2023 ou 2023-2024. In the French Community of Belgium, the academic year runs from September 14 to September 13
  - not already hold an undergraduate degree
- Candidates, whatever their nationality, with a secondary school diploma **from a country outside the European Union**, must have obtained an average of 13/20 minimum or, failing that, have obtained this average, have passed one year of study in Belgium (for

Teaching method

Whenever possible, teachers in the School of Mathematics give priority to close supervision: small-group work, individual tuition, rapid and personalised feedback on activities, active participation of students in the School's teaching decisions. All the courses in the programme contribute to the acquisition of skills such as the capacity for abstract thinking and for reasoning. Other skills (aptitude for communication, independent learning, document research) are especially exercised in the third-year review work.

In the first year, tutorial sessions allow those students who wish to do so to take stock of topics considered in the course in a personalised way with the help of teachers. The Faculty also holds sessions on the issue of working methods as well as on ways of approaching different subjects and on time management.

For the three years, exercise sessions and laboratory sessions are held in small groups accompanied by assistants. Individual and/or group work is expected for some activities, especially in the third-year review work, with the help of assistants or teachers. Internet sites (the iCampus platform) are linked to most courses: they contain useful information as well as syllabi and other documents vital for students' work.

Evaluation

The evaluation methods comply with the regulations concerning studies and exams. More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Assessment methods conform to academic regulations and procedures. More details on the methods employed in each teaching unit are available in their description sheet, under the heading 'Assessment methods for student learning'.

Different methods are in place in order to evaluate the knowledge and skills acquired in the course of the learning period; these are adapted to the following types of performance: continuous assessment, especially for practical exercises; assessment of personal work (reading, consultation of databases and bibliographical references, monograph and report writing); overall assessment (written and/or oral) during examination sessions; assessment of public presentations.

In the first year, compulsory tests contributing to the final mark for each subject are held one month after the beginning of classes in the first semester.

Mobility and/or Internationalisation outlook

International mobility is recommended rather within the framework of master programmes. In special cases, however, it is possible to consider international mobility at the end of the bachelor's degree.

Moreover, participation in a short mobility can be envisaged at the end of the bachelor's degree in the framework of the Athens network https://www.paristech.fr/fr/international/europe/athens

Possible trainings at the end of the programme

Regardless of the minor or blocks of courses chosen, the Bachelor's degree in mathematical sciences gives direct access to the following programs:

- Master [120] in mathematical sciences ;
- Master [60] in mathematical sciences ;
- Master [120] in actuarial sciences ;
- Master [120] in data science, statistics orientation ;
- Master [120] in statistics, general orientation

It can also be accessed, subject to a slight additional training or the selection of appropriate courses in the bachelor's program or minor:

- Master [120] in statistics, biostatistics orientation ;

Contacts

Curriculum Management

Entity

Structure entity	SST/SC/MATH
Denomination	(MATH)

Faculty	Faculty of Science