

MATH1BA - Introduction

Introduction

Introduction

The Bachelor's in Mathematics offers:

- a basic training in algebra, geometry, analysis and physics;
- an introduction to more advanced topics: complex analysis, differential equations, differential geometry, measure theory, group theory, multilinear and commutative algebra, etc.;
- teaching which opens the way to applied mathematics: numerical and computational methods, probability and statistics, mechanics, etc.;
- progressive learning and a programme which leaves time for high-quality personal work;
- close and high-quality supervision: supervised exercises, laboratory exercises, group and individual work, tutorial sessions;
- the opportunity to carry out a first personal research project under the supervision of a teacher.

Your profile

You :

- love mathematics and have a sense of the precision and rigour of reasoning
- wish to develop your analytical skills and apply your capacity for reasoning and your spirit of abstraction in order to understand, model and solve complex situations in every field of application of mathematics;
- are committed to research and hope to carry out a first project in collaboration with internationally renowned researchers;
- plan to teach mathematics in secondary school and wish to acquire a solid training in fundamental mathematics

Your future job

Training in mathematics aims to master advanced mathematical tools and to develop skills such as the capacity for abstract thinking, the analysis and modelling of complex situations, the sense of precision and of rigour in reasoning, and aptitude for communication. These skills can prove invaluable in fundamental mathematical research, in teaching mathematics, as well as in many other professions where mathematics interacts with other disciplines such as physics, chemistry, biology, pharmacology, climatology, meteorology, astronomy, computing, cryptography, statistics and biostatistics, telecommunications, finance, actuarial science, etc.

Your programme

The programme for the Bachelor in Mathematics is composed of 180 credits spread over three years. It is formed of general training (150 credits) and of an additional module minor or a minor introducing other fields (30 credits).

The first-year programme (60 credits in the major) is identical to the first-year programme for Bachelor in Physics, thus allowing transfer to this programme.

By the end of the course the student will have acquired the disciplinary foundations needed to pursue studies in mathematics or in closely related fields (physics, statistics, actuarial science, computing).

MATH1BA - Teaching profile

Learning outcomes

By the end of the course the student will have acquired the knowledge of the discipline and the transferable skills needed to pursue

MATH1BA Programme

Detailed programme by subject

- Mandatory
- ✘ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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...)

Year

1 2 3

○

o 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

⊗ LMAT1223	Differential equations	Heiner Olbermann	03 [q2] [30h+15h] [5 Credits]  > English-friendly			X
⊗ LMAT1261	Lagrangian and Hamiltonian mechanics	Christian Walmsley Hagendorf	03 [q1] [22.5h+30h] [5 Credits]  > English-friendly		X	
⊗ LMAT1323	Topology	Pedro Dos Santos Santana Forte Vaz	03 [q1] [30h+15h] [5 Credits]  > English-friendly		X	
⊗ LMAT1322	Real and harmonic analysis	Augusto Ponce	03 [q2] [30h+30h] [5 Credits]  > English-friendly			X
⊗ LMAT1342	Geometry 33 0.902 0.5216 rg 270.290 f Q q 1 0 0 1 73.283 190.723 cm q20.014999 1 1 1 h W n 1 G [] 0 060 7.503 0.723 cm q20.003 0.723 cm q.01					

✂ LINFO1103

o Sciences humaines

o Philosophie

L'étudiant choisit

From 2 to 4 credit(s)

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

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✂ Bloc Mathématique

✂ LMAT1261	Lagrangian and Hamiltonian mechanics	Christian Walmsley Hagendorf	FR [q1] [22.5h +30h] [5 Credits] 🌐 > English- friendly
✂ LMAT1323	Topology	Pedro Dos Santos Santana Forte Vaz	FR [q1] [30h +15h] [5 Credits] 🌐 > English- friendly

✂ Bloc Statistique et Informatique

A l'exception de LINFO1103 et LINFO1123, il est recommandé de suivre LEPL1402 avant les autres cours de la liste ci-dessous :

✂ LINFO1103	Introduction to algorithms	Guillaume Derval (compensates Pierre Dupont)
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Multivariate Statistica 8.302 hoi 27 226.770996 0 | 226.7747.302 hoi.33846.302 hoiq1]

o 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

⊗ LMAT1223	Differential equations	Heiner Olbermann	EB [q2] [30h +15h] [5 Credits] > English-friendly
⊗ LMAT1322	Real and harmonic analysis	Augusto Ponce	EB [q2] [30h +30h] [5 Credits] > English-friendly
⊗ LMAT1342	Geometry 3	Pascal Lambrechts	EB [q1] [30h +30h] [5 Credits] > English-friendly
⊗ LMAT1331	Commutative algebra	Enrico Vitale	EB [q1] [30h +15h] [5 Credits]
⊗ LMAT1361	Galois Theory	Pierre-Emmanuel Caprace	EB [q2] [30h +15h] [5 Credits]

⊗ Bloc Statistique et Informatique

A l'exception de LINFO1103 et LINFO1123, il est recommandé de suivre LEPL1402 avant les autres cours de la liste ci-dessous :

⊗ LINFO1123	Calculability, Logic and Complexity	Yves Deville	EB [q2] [30h +30h] [5 Credits]
⊗ LINFO1121	Algorithms and data structures	Pierre Schaus	EB [q1] [30h +30h] [5 Credits]

⊗ Cours au choix

L'étudiant choisit un des deux cours suivants :

⊗ LINGE1222	Multivariate Statistical Analysis	Johan Segers	EB [q2] [30h +15h] [4 Credits]
⊗ LBIRA2110A	Statistical analysis of multivariate data	Xavier Draye	EB [q2] [30h +15h] [4 Credits]

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L'étudiant choisit un des deux cours 1690021 T 1 1 1008 174.690

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](#)
- [Specific access requirements](#)
- [Access based on validation of professional experience](#)
- [Special requirements to access some programmes](#)

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](https://uclouvain.be/fr/etudier/inscriptions/examens-admission.html) (https://uclouvain.be/fr/etudier/inscriptions/examens-admission.html) 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 2023-2024, you must have obtained your diploma during the academic years 2020-2021, 2021-2022 ou 2022-2023. 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 example special Maths / sciences). A non-successful year will not be taken into consideration.

- For any secondary school diploma **from a European Union country**, the admission request must contain the equivalence of your

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 (<https://uclouvain.be/fr/decouvrir/rgee.html>). 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

Whatever the minor or course blocks selected, the Bachelor in Mathematics allows access to the following programmes:

- [Master \[120\] in Mathematics](#), research or teaching focus;
- [Master \[60\] in Mathematics](#);
- [Master \[120\] in Actuarial Science](#);
- [Master \[120\] in Data Science : Statistic](#)

It also provides access through additional training or the choice of a appropriate minor to the programs:

- [Master \[120\] in Statistics: General](#)
- [Master \[120\] in Statistics: Biostatistics](#)

With the choice of an appropriate minor and/or a programme of complementary training, the Bachelor in Mathematics allows access to certain course choices of [Master \[120\] in Physics](#), [Master \[120\] in Computer Science](#) or [Master \[120\] in Economics: General](#).

En outre, des masters UCL (généralement orphelins) sont largement accessibles aux diplômés bacheliers UCL. Par exemple :

In addition, UCL master's programmes (usually orphaned) are widely available to UCL bachelors. For example:

- [Master \[120\] in Population and Development Studies](#) (direct access for any bachelor),
- [Master \[120\] in European Studies](#) (direct access for any bachelor with a minor in European Studies; on file for any other bachelor),
- ...

Contacts

Curriculum Management

Entity

Structure entity	SST/SC/MATH
Denomination	(MATH)
Faculty	Faculty of Science (SC)
Sector	Sciences and Technology (SST)
Acronym	MATH
Postal address	Chemin du Cyclotron 2 - bte L7.01.02 1348 Louvain-la-Neuve Tel: +32 (0) 10 47 31 52 - Fax: +32 (0) 10 47 25 30 https://uclouvain.be/fr/facultes/sc/math
Website	https://uclouvain.be/fr/facultes/sc/math

Academic supervisor: [Jean Van Schafingen](https://uclouvain.be/repertoires/jean.vanschafingen) (<https://uclouvain.be/repertoires/jean.vanschafingen>)

Jury

- President: [Tim Van der Linden](https://uclouvain.be/repertoires/tim.vanderlinden) (<https://uclouvain.be/repertoires/tim.vanderlinden>)
- Secretary and Study advisor: [Pierre Bieliavsky](https://uclouvain.be/repertoires/pierre.bieliavsky) (<https://uclouvain.be/repertoires/pierre.bieliavsky>)

Useful Contact(s)

- Administrative manager for the student's annual program: [Nathalie Micha](https://uclouvain.be/repertoires/nathalie.micha) (<https://uclouvain.be/repertoires/nathalie.micha>)
- Secretary of the School of mathematics: [Catherine De Roy](https://uclouvain.be/repertoires/catherine.deroy) (<https://uclouvain.be/repertoires/catherine.deroy>)

