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MATH2M1 - Introduction

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Introduction

Introduction

The Master 60 in Mathematics offers

- a thorough education in cutting-edge fundamental mathematics;
- an interdisciplinary introduction to physics, statistics, probability, cryptography, information theory, financial mathematics, actuarial science, etc.;

  teaching based on your personal learning history;
- the possibility of moving directly to the second year of the Master 120 in mathematics and to the teacher training certificate (upper secondary education).

Your profile

You

- 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.

Your future job

Whatever his specialisation, the mathematician will be able to exercise his talents in a variety of very different professional sectors and to make the most of the powerful tools he has developed in situations that are often a long way from mathematics. The disciplinary knowledge and skills of the mathematician offer access to many professions in which mathematics interacts with other disciplines (particularly in research laboratories in the climatology sector, in meteorology and in astronomy, in research and development institutes in the biochemistry and pharmacology sectors, in analysis and development departments in the economics sector, in finance and insurance, in computer companies, in cryptography and telecommunications).

Your programme

This Master program offers a solid training in fundamental mathematics that will equip you with tools in the main mathematical disciplines. Learning is completed by optional courses in your chosen fields in mathematics or in closely related fields (applied mathematics, physics, statistics and biostatistics, actuarial science, computing...).

Optional courses [40.0]

OPTIONAL COURSES [40.0]

○ 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...)

Students will choose at least 15 credits from the list of courses shown below and will complete the programme with courses in the research focus or with options from the 120 credits Master in Mathematical Sciences.

○ **Content:**

✖ LMAT2130	Partial differential equations	Heiner Olbermann	[EN] [q1] [30h+15h] [5 Credits] 🌐
✖ LMAT2415	Advanced harmonic analysis	Jean Van Schaftingen	[FR] [q1] [30h+15h] [5 Credits] 🌐
✖ LMAT2250			

Supplementary classes

> **To access this Master, students must have a good command of certain subjects. If this is not the case, in the first annual block of their Masters programme, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.**

⊙ Mandatory
⊗ Optional
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⊙ Enseignements supplémentaires

⊗ LMAT1221	Mathematical analysis : integration	Heiner Olbermann	[FR] [q1] [30h+30h] [5 Credits] 🌐	> *English-friendly*
⊗ LMAT1222	Complex analysis 1	Tom Claeys	[FR] [q2] [30h+15h] [5 Credits] 🌐	> *English-friendly*
⊗ LMAT1321	Functional analysis and partial differential equations	Jean Van Schaftingen	[FR] [q1] [45h+45h] [7 Credits] 🌐	> *English-friendly*
⊗ LMAT1323	Topology	Pedro Dos Santos Santana Forte Vaz	[FR] [q1] [30h+15h] [5 Credits] 🌐	> *English-friendly*
⊗ LMAT1231	Multilinear algebra and group theory	Pierre-Emmanuel Caprace	[FR] [q1] [30h+30h] [5 Credits] 🌐	> *English-friendly*
⊗ LMAT1236	Introduction to logic: set theory		[FR] [q2] [30h+15h] [5 Credits] ⊘ 🌐	> *English-friendly*
⊗ LMAT1237	Introduction to logic: model theory	Enrico Vitale	[FR] [q2] [30h+15h] [5 Credits] ⊕ 🌐	> *English-friendly*
⊗ LMAT1241	Geometry II	Pierre Bieliavsky	[FR] [q2] [45h+30h] [6 Credits] 🌐	> *English-friendly*
⊗ LMAT1271	Calculation of probability and statistical analysis	Rainer von Sachs	[FR] [q2] [30h+30h] [6 Credits] 🌐	> *English-friendly*
⊗ LMAT1371	Probability Theory	Karim Barigou	[FR] [q2] [30h+22.5h] [5 Credits] 🌐	
⊗ LMAT1151	Numerical analysis : tools and software of calculus	Jean Van Schaftingen	[FR] [q1] [30h+45h] [5 Credits] 🌐	> *English-friendly*
⊗ LMAT1351	Approximation: methods et theory	Tom Claeys	[EN] [q1] [30h+30h] [5 Credits] 🌐	> *French-friendly*

The programme's courses and learning outcomes

For each UCLouvain training programme, a reference framework of learning outcomes specifies the the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

MATH2M1 - Information

Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

General and specific admission requirements for this programme must be satisfied at the time of enrolling at the university.

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

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

SUMMARY

Specific access requirements

In addition to the access conditions described below, candidates will have to provide proof of a sufficient command of the French language (level B1 of the CEFR, Common European Framework of Reference for Languages).

Students who wish to be admitted on the basis of a dossier (see tables below) are invited to consult the criteria for the evaluation of application.

University Bachelors

Access based on application

Non university Bachelors

> Find out more about links to the university

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	

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 seminars specific to the focuses (where students are responsible for work progress), in work linked to the preparation of the dissertation. The interdisciplinary character of the programme is reinforced by the presence in the options of courses taken from the Masters programmes in physical sciences, in statistics and biostatistics, in actuarial science and in applied mathematics.

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".*

Students will mainly be assessed on the basis of individual work (e.g. reading, consultation of databases and bibliographic references, writing monographs and reports, presentation of seminars, dissertation and work placement). Where necessary, students will also be assessed on how much they have learned from lectures. As far as possible, there will be continuous assessment, including regular 'open book examinations'. Certain activities will not be given a precise mark but will be officially certified. Assessment of the dissertation is in two stages : a 'progress report' at the end of the first year of the Master and the final presentation.

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