

## Table of contents

Introduction .....	2
Teaching profile .....	3
Learning outcomes .....	3
Programme .....	3
Detailed programme by subject .....	3
The programme's courses and learning outcomes .....	4
Information .....	5
Access Requirements .....	5
Evaluation .....	5
Possible trainings at the end of the programme .....	5
Contacts .....	5

## APPMATH - Introduction

### Introduction

---

#### Introduction

The aim of the in-depth minor in mathematics is to offer learning that is supplementary to the discipline of the Bachelor's major. The very wide range of courses has been devised for students of the Bachelor in Mathematics

- who wish to supplement their Bachelor course with courses that remain within the field of mathematics, and/or
- who wish to supplement their Bachelor course with courses close to mathematics but who do not wish to undertake a single-topic minor (minor in computer science, in physics, in engineering science, applied mathematics, etc.).

## APPMATH - Teaching profile

### Learning outcomes

The in-depth minor in mathematics contributes to the acquisition of the knowledge and skills appropriate to the Bachelor of Mathematics:

- disciplinary basics needed to pursue studies in mathematics or in closely related fields.
- capacity for abstract thought and critical spirit
- skills in scientific communication
- independent learning

These skills are detailed in the presentation of the programme for the Bachelor in Mathematics. Depending on the courses chosen, the student will have acquired supplementary training in closely related disciplines (physics, statistics and probability, economics, computing, applied mathematics). These courses help to develop the capacity for the analysis, in depth and from a variety of points of view, of a mathematical problem or a complex system belonging to scientific disciplines other than mathematics, in order to extract the essential features and to relate them to the most suitable theoretical tools.

### Programme

#### DETAILED PROGRAMME BY SUBJECT

- Mandatory
- ⊗ Optional
- △ Not offered in 2026-2027
- ⊙ Not offered in 2026-2027 but offered the following year
- ⊕ Offered in 2026-2027 but not the following year
- △ ⊕ Not offered in 2026-2027 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...)

30 crédits

Year

2 3

#### o Content:

#### o Cours au choix (30 crédits)

From the following courses, students choose 10 credits in the second year and 20 credits in the third year, in agreement with their study adviser.

#### ⊗ Mathématiques

⊗ LMAT1236	<a href="#">Introduction to logic: set theory</a>	Tim Van der Linden	FR [q2] [30h+15h] [5 Credits] ⊙ 🌐 > English-friendly	X	X
⊗ LMAT1237	<a href="#">Introduction to logic: model theory</a>	Enrico Vitale	FR [q2] [30h+15h] [5 Credits] ⊕ 🌐 > English-friendly	X	X
⊗ LMAT1261	<a href="#">Lagrangian and Hamiltonian mechanics</a>	Christian Walmsley Hagendorf	FR [q1] [22.5h+30h] [5 Credits] 🌐 > English-friendly	X	
⊗ LMAT1323	<a href="#">Topology</a>	Pedro Dos Santos Santana Forte Vaz	FR [q1] [30h+15h] [5 Credits] 🌐 > English-friendly	X	
⊗ LMAT1322	<a href="#">Real and harmonic analysis</a>	Augusto Ponce	FR [q2] [30h+30h] [5 Credits] 🌐 > English-friendly		X
⊗ LMAT1331	<a href="#">Commutative algebra</a>	Enrico Vitale	FR [q1] [30h+15h] [5 Credits] 🌐		X
⊗ LMAT1342	<a href="#">Geometry 3</a>	Pascal Lambrechts	FR [q1] [30h+30h] [5 Credits] 🌐 > English-friendly		X
⊗ LMAT1223	<a href="#">Differential equations</a>	Heiner Olbermann	FR [q2] [30h+15h] [5 Credits] 🌐 > English-friendly		X
⊗ LMAT1361	<a href="#">Galois Theory</a>	Pierre-Emmanuel Caprace	FR [q2] [30h+15h] [5 Credits] 🌐		X

				Year	
				2	3
✂ LMAT2440	Number theory	Pierre-Emmanuel Caprace Olivier Pereira	EN [q2] [30h+15h] [5 Credits] > English-friendly		X
✂ LMAT2170	History and epistemology of mathematics	Pierre Bieliavsky Pierre-Emmanuel Caprace Marino Gran Jean Van Schaffingen	EN [q1] [30h+15h] [5 Credits]	X	X

### ✂ Mathématiques appliquées et informatique

✂ LMAT2450	Cryptography	Olivier Pereira	EN [q1] [30h+15h] [5 Credits] > French-friendly		X
✂ LMAT2460	Finite mathematics and combinatorial structures	Jean-Charles Delvenne Raphaël Jungers	EN [q1] [30h] [5 Credits]		X
✂ LINMA1170	Numerical linear algebra	Raphaël Jungers Jean-François Remacle	EN [q1] [30h+22.5h] [5 Credits]	X	X
✂ LINMA1691	Discrete mathematics - Graph theory and algorithms	Vincent Blondel Jean-Charles Delvenne	EN [q1] [30h+22.5h] [5 Credits]	X	X
✂ LINMA1702	Optimization models and methods I	François Glineur	EN [q2] [30h+22.5h] [5 Credits]	X	X
✂ LINFO1123	Calculability and Complexity	Charles Pecheur	EN [q2] [30h+30h] [5 Credits]	X	X

### ✂ Physique

✂ LPHYS2211	Group theory	Philippe Ruelle	EN [q2] [22.5h+22.5h] [5 Credits] > French-friendly		X
✂ LPHYS2114	Nonlinear dynamics	Michel Crucifix	EN [q1] [22.5h+22.5h] [5 Credits] > French-friendly	X	X
✂ LPHYS1241	Quantum Physics 1	Agni Bethani Matthieu Génévriez	EN [q2] [30h+30h] [5 Credits]	X	X
✂ LPHYS1342	Quantum Physics 2	Christophe Ringeval	EN [q1] [45h+22.5h] [5 Credits] > English-friendly		X

### ✂ Economie et gestion

✂ LINGE1221	Econometrics		EN [q2] [30h+15h] [5 Credits]		X
✂ LECGE1222	Microeconomics	François Maniquet	EN [q2] [45h+15h] [6 Credits]	X	X
✂ LECGE1333	Game theory and information in economics		EN [q2] [30h+10h] [5 Credits]	X	X
✂ LECGE1330	Industrial organization	Paul Belleflamme	EN [q1] [30h+15h] [5 Credits]	X	X

### ✂ Développement durable et transition

L'étudiant peut s'inscrire à maximum une des 2 UEs suivantes: LEPL1804 et LBIR2050.

✂ LGEO1232	The climate and its changes	Michel Crucifix Kristof Van Oost	EN [q2] [30h] [5 Credits]	X	X
✂ LEPL1804	Sustainable development and transition <i>Les unités d'enseignement LEPL1804 et LBIR2050 ne sont pas cumulables: si l'étudiant a déjà suivi ou suit l'une de ces 2 UEs, il ne peut pas s'inscrire à l'autre.</i>	David Bol Francesco Contino Patricia Luis Alconero Xavier Marichal Jean-Pierre Raskin	EN [q1] [30h+15h] [3 Credits]	X	X
✂ LBIR2050	Challenges of sustainable development and transition <i>Les unités d'enseignement LEPL1804 et LBIR2050 ne sont pas cumulables: si l'étudiant a déjà suivi ou suit l'une de ces 2 UEs, il ne peut pas s'inscrire à l'autre.</i>	Nathalie Delzenne Valérie Swaen (coord.)	EN [q2] [20h+10h] [5 Credits]	X	X

## 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.

## APPMATH - Information

### Access Requirements

---

This minor is accessible from the second year, only to students enrolled in the Bachelor of Mathematics programme.

### Evaluation

---

**The evaluation methods comply with the [Academic regulations and procedures](#). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".**

### Possible trainings at the end of the programme

---

The in-depth minor in mathematics supplements the training of Bachelor of Mathematics students.

The Bachelor in Mathematics has access to the following programmes:

- master 120 in mathematics, research or teaching focus;
- master 60 in mathematics;
- master in statistics, general or biostatistics;
- master in actuarial science.

### Contacts

---

#### Curriculum Management

Entity

Structure entity

Denomination

Faculty

Sector

Acronym

Postal address

SST/SC/MATH

(MATH)

Faculty of Science (SC)

Sciences and Technology (SST)

MATH

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

Academic supervisor: [Jean Van Schaftingen](#)

Useful Contact(s)

- Study advisor: [Dimitri Maquet](#)
- Administrative manager for the student's annual program: [Nathalie Micha](#)

