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## APPMATH - Introduction

### Introduction

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#### 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 2021-2022
- ⊙ Not offered in 2021-2022 but offered the following year
- ⊕ Offered in 2021-2022 but not the following year
- △ ⊕ Not offered in 2021-2022 or the following year
- Activity with requisites
- [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

#### ○ Content:


##### ○ Cours au choix (30 credits)

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.

⊗ LMAT1235	Some notions of mathematical logic	Tim Van der Linden Enrico Vitale	[FR] [q2] [30h+15h] [5 Credits]	X	
⊗ LMAT1261	Mécanique lagrangienne et hamiltonienne	Christian Hagendorf	[FR] [q1] [22.5h+30h] [5 Credits]	X	
⊗ LMAT1323	Topology	Pedro Dos Santos Santana Forte Vaz	[FR] [q1] [30h+15h] [5 Credits]	X	
⊗ LMAT1322	Real and harmonic analysis	Augusto Ponce	[FR] [q2] [30h+30h] [5 Credits]		X
⊗ LMAT1331	Commutative algebra	Pierre-Alain Jacqmin (compensates Marino Gran)	[FR] [q2] [30h+15h] [5 Credits]		X
⊗ LMAT1342	Geometry 3	Pascal Lambrechts	[FR] [q1] [30h+30h] [5 Credits]		X
● LMAT1223	Differential equations	Heiner Olbermann	[FR] [q2] [30h+15h] [5 Credits]		X
● LMAT1361	Galois Theory	Pierre-Emmanuel Caprace	[FR] [q1] [30h+15h] [5 Credits]		X
⊗ LMAT2440	Number theory	Olivier Pereira Jean-Pierre Tignol	[FR] [q1] [30h+15h] [5 Credits]		X
⊗ LMAT2450	Cryptography	Olivier Pereira	[FR] [q1] [30h+15h] [5 Credits]		X
⊗ LMAT2460	Finite mathematics and combinatorial structures	Jean-Charles Delvenne Raphaël Jungers	[FR] [q1] [30h] [5 Credits]		X

Year

2 3

⊗ LEPL1110	Finished elements	Vincent Legat Jean-François Remacle	FR [q2] [30h+30h] [5 Credits]	x	x
⊗ LINMA1170	Numerical analysis	François Henrotte (compensates Jean-François Remacle)	FR [q2] [30h+22.5h] [5 Credits]	x	x
⊗ LINMA1691	Discrete mathematics - Graph theory and algorithms	Vincent Blondel Jean-Charles Delvenne	FR [q1] [30h+22.5h] [5 Credits]	x	x
⊗ LINMA1702	Optimization models and methods I	François Glineur	FR [q2] [30h+22.5h] [5 Credits]	x	x
⊗ LINFO1123	Calculability, Logic and Complexity	Yves Deville	FR [q2] [30h+30h] [5 Credits]	x	x
⊗ LPHYS2211	Group theory	Philippe Ruelle	EN [q2] [22.5h+22.5h] [5 Credits]		x
⊗ LPHYS2114	Nonlinear dynamics	Christian Hagendorf	EN [q1] [22.5h+22.5h] [5 Credits]	x	x
⊗ LPHYS1241	Quantum Physics 1	Marco Drewes	EN [q2] [30h+30h] [5 Credits]	x	x
⊗ LPHYS1342	Quantum Physics 2 	Christophe Ringeval	FR [q1] [45h+22.5h] [5 Credits]		x
⊗ LINGE1221	Econometrics	Sébastien Van Bellegem	FR [q2] [30h+15h] [5 Credits]		x
⊗ LECGE1222	Microeconomics	Johannes Johnen Arastou Khatibi François Maniquet	FR [q1 or q2] [45h+15h] [5 Credits]	x	x
⊗ LECGE1333	Game theory and information in economics		EN [q2] [30h+10h] [5 Credits] $\Delta$	x	x
⊗ LECGE1330	Industrial organization	Paul Belleflamme	EN [q1] [30h+15h] [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

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#### Specific access requirements

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

### Evaluation

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***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".***

### Possible trainings at the end of the programme

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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

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#### 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

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<https://uclouvain.be/fr/facultes/sc/math>

Website

Academic supervisor: [Jean Van Schaftingen](#)

Useful Contact(s)

- Study advisor: [Tim Van der Linden](#)
- Administrative manager for the student's annual program: [Nathalie Micha](#)
- Secretary of the School of mathematics: [Catherine De Roy](#)

