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## Introduction

### Introduction

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## Teaching profile

### Learning outcomes

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By the end of the course the student will have strengthened the disciplinary knowledge useful in undertaking a Master in mathematics or in closely related fields.

In particular, he will be capable of :

- choosing and using the fundamental methods and tools of calculation to solve mathematical problems;
- recognise the fundamental concepts of important current mathematical theories. The student will have developed his capacity for abstract thought and his critical spirit and will in particular be able to:
  - argue within the context of the axiomatic method.
  - identify the key arguments and the structure of a proof, and also construct a proof independently.
  - evaluate the rigour of a mathematical or logical argument and identify any possible flaws in it.

## Detailed programme

### PROGRAMME BY SUBJECT

Courses may be spread over the second and third years of the Bachelor programme, while respecting the various prerequisites detailed in the course descriptions.

- Mandatory
- △ Courses not taught during 2019-2020
- ⊕ Periodic courses taught during 2019-2020
- ⊗ Optional
- ⊙ Periodic courses not taught during 2019-2020
- Activity with requisites

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

Year

2 3

#### o Contenu:

##### o Tronc commun

Courses LMAT1231 and LMATH1241 are compulsory. The student will choose at least one course from LMAT1221 and LMAT1222.

○ LMAT1231	<a href="#">Multilinear algebra and group theory</a>	Marino Gran (compensates Tim Van der Linden) Tim Van der Linden	30h+30h	5 Credits	1q	x	x
○ LMAT1241	<a href="#">Geometry II</a>	Pierre Bieliavsky	45h+30h	6 Credits	2q	x	x
⊗ LMAT1221	<a href="#">Mathematical analysis : integration</a>	Heiner Olbermann	30h+30h	5 Credits	1q	x	x
⊗ LMAT1222	<a href="#">Complex analysis 1</a>	Luc Haine	30h+15h	5 Credits	2q	x	x

##### o Cours au choix

The student will complete the programme with courses chosen from the list shown below, in such a way as to total 30 credits.

⊗ LMAT1223	<a href="#">Differential equations</a>	Heiner Olbermann	30h+15h	5 Credits	2q	x	x
⊗ LMAT1261	<a href="#">Mécanique lagrangienne et hamiltonienne</a>	Christian Hagendorf	22.5h +30h	5 Credits	1q	x	x
⊗ LMAT1323	<a href="#">Topology</a>	Pedro Dos Santos Santana Forte Vaz	30h+15h	4 Credits	1q	x	x
⊗ LMAT1321	<a href="#">Functional analysis and partial differential equations</a>	Jean Van Schaftingen Michel Willem (compensates Jean Van Schaftingen)	45h+45h	7 Credits	1q	x	x
⊗ LMAT1331	<a href="#">Commutative algebra</a>	Marino Gran	30h+15h	4 Credits	2q	x	x
⊗ LMAT1342	<a href="#">Geometry 3</a>	Luc Haine	30h+30h	5 Credits	1q	x	x
⊗ LPHYS2211	<a href="#">Group theory</a>	Philippe Ruelle	22.5h +22.5h	5 Credits	2q	x	x

### COURSE PREREQUISITES

A document entitled [en-prerequis-2019-min-lmath100i.pdf](#) specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

These activities are identified in the study programme: their title is followed by a yellow square.

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult [regulation of studies and exams](#).

## **THE PROGRAMME'S COURSES AND LEARNING OUTCOMES**

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document *"In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"*

*The document is available by clicking [this link](#) after being authenticated with your UCLouvain account.*

## Information

### Liste des bacheliers proposant cette mineure

- > Bachelor in Engineering [en-prog-2019-fsa1ba]
- > Bachelor in Economics and Management [en-prog-2019-ecge1ba]
- > Bachelor in Physics [en-prog-2019-phys1ba]

## Admission

### Specific Admission Requirements

The minor in mathematics is accessible to all Bachelor students whose programme allows it: see the summary table of the different minors.

It is especially recommended to Bachelor students whose major programme contains a solid basic training in mathematics. Particularly concerned are Bachelor students in management, in engineering science: civil engineering, in engineering science: architectural engineer, and in physics.

## 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".**

## Possible trainings at the end of the programme

Majors-minors which offer direct access to the master(s):

Students with baccalaureates in physical science or engineering science, civil engineering elective or architectural civil engineering elective, will be admitted to the master's in mathematical science, possibly with a program adapted to suit their needs. Any student who is considering this possibility is asked to make contact as soon as possible with the conseiller aux études (course adviser) for the department of mathematics.

## 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

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

Web site

Academic supervisor: [Pascal Lambrechts](#)

Useful Contact(s)

- Study advisor for mathematics: [Tim Van der Linden](#)
- Administrative manager for the annual program of the student registered in the Faculty of sciences: [Nathalie Micha](#)

- Secretary of the School of mathematics: [Julie Genbrugge](#)

