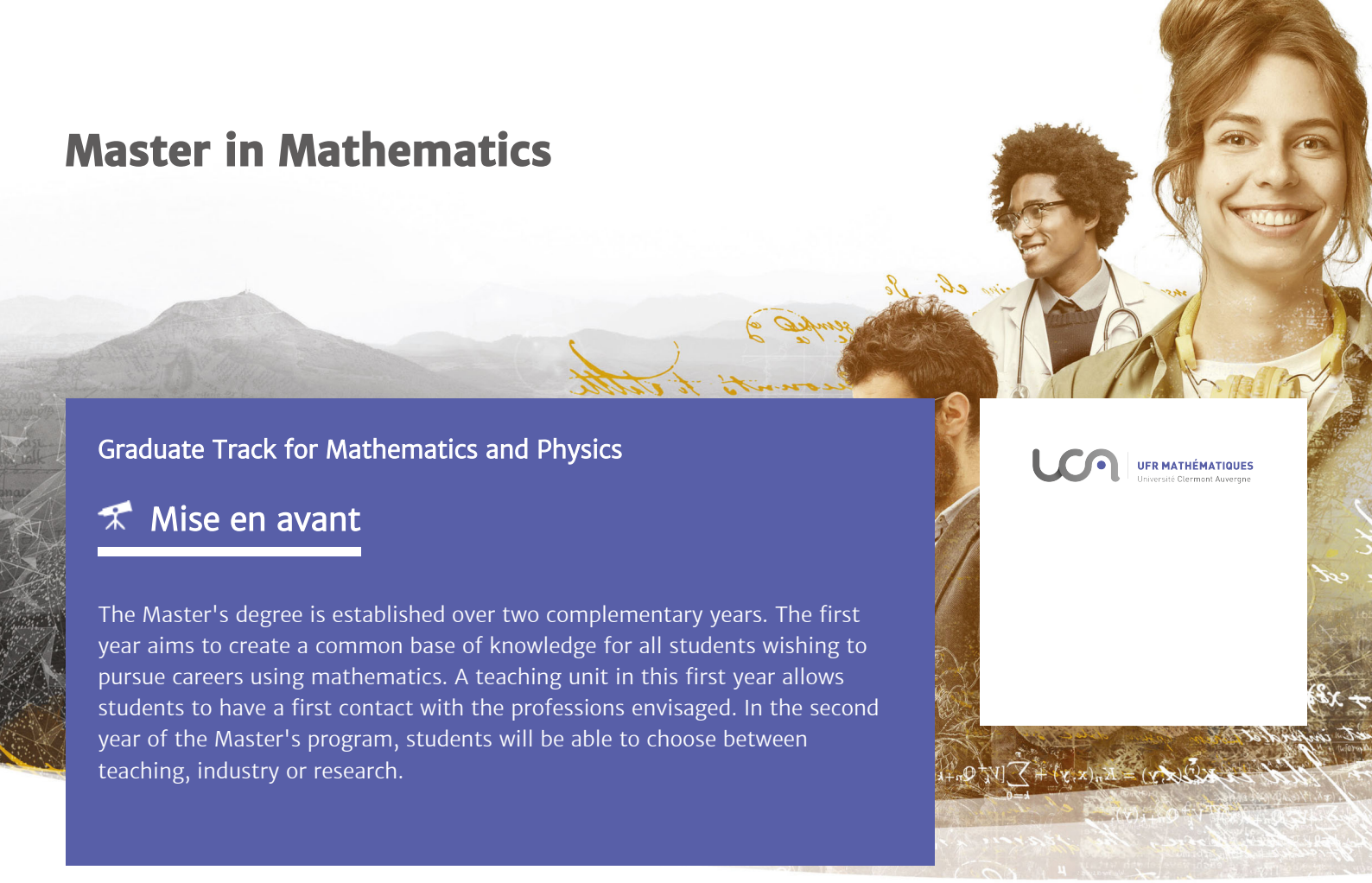
Master in Mathematics



Graduate Track for Mathematics and Physics

Mise en avant

The Master's degree is established over two complementary years. The first year aims to create a common base of knowledge for all students wishing to pursue careers using mathematics. A teaching unit in this first year allows students to have a first contact with the professions envisaged. In the second year of the Master's program, students will be able to choose between teaching, industry or research.

Présentation

Enjeux

The aim of this master's degree is to offer a high level of training in pure and applied mathematics. The training provided in the Master's degree in Mathematics naturally opens the doors to a doctorate in pure or applied mathematics and allows the preparation of the agrégation in mathematics.
The Master contains several courses shared with the engineering schools PolyTech Clermont and ISIMA, which allows engineering students to complete their training and university students to approach certain aspects of the applications of mathematics. Working in a research and development department of a company is an additional opportunity. At the end of the training, students know how to solve a complex mathematical prolem using specific tools, methods and theories acquired during the training.

Specificities

- Possibility for students to prepare the Aggregation of Mathematics with many hours dedicated to this training
- The recognition of the Laboratoire de Mathématiques Blaise Pascal at the national level is a major asset for the dynamics of this Master

L'essentiel

Nature de la formation

1

Durée de la formation

- 2 years

Public

Niveau(x) de recrutement

- Baccalauréat +3

Langues d'enseignement

- French

Modalités

- Présentiel

Lieu(x) de la formation

- Aubière

- Multiple possibilities to pursue a PhD (in Clermont-Ferrand or in other universities)

Lieux

Campus des Cézeaux

Laboratoires

Laboratoire de Mathématiques Blaise Pascal (LMBP)

Établissements

Polytech
Isima

Contacts

Renseignements

Responsable(s) de formation

Hacene DJELLOUT
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Contacts administratifs

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Admission

Pré-requis

Niveau(x) de recrutement

Baccalauréat +3

Formation(s) requise(s)

Have a degree in mathematics (bachelor, 1st year of master, engineering school).

Candidature

Modalités de candidature

Application to the Master in Mathematics

- Required training:

To be able to apply to the Master in Mathematics, students must have a background in mathematics; bachelor's degree, master's degree, engineering school.

Required recruitment level: Baccalauréat +3

An examination of the candidates' profile is carried out on the basis of their application file and a possible interview.

- Application form: Mon Master

** Selection: for capacity's reasons and supervision of long internships at the end of the program, the program sets a numerus clausus for admission to M1 (first year of the Master). A selection on applications will therefore be made by the admission jury among all the students applying for the M1, whatever their original degree.*

Merit scholarship and application

The Graduate Track for Mathematics and Physics offers excellence grants to its students, up to 4,000 euros per academic year.

As part of its educational development policy, the University of Clermont Auvergne has set up a financial aid scheme for students enrolled in the Graduate Track for Mathematics and Physics.

This support is awarded according to criteria of academic excellence, motivation and quality of the study project. The grant cover the first year of the Master's program as well as the first semester of the second year, until the beginning of the internship, for a total of 16 months.

How to apply?
A specific application file must be prepared, in addition to the application file for the Master, which must contain the following elements

- **A curriculum vitae**
- **A letter of motivation** presenting the study or research project and the reasons for your desire to come and study at the University of Clermont Auvergne in the framework of this program.
- **Transcripts of your Bachelor's degree** or equivalent diploma
- **Two letters of support** from teachers or people who have worked with you in an academic and/or scientific context

APPLICATION LINKS:

FR https://demarches.adullact.org/commencer/bourse-d-excellence-gt-maths-physique
EN https://demarches.adullact.org/commencer/merit-scholarship-gt-mathematics-and-physics

Programme

Les informations ci-dessous sont données à titre indicatif et peuvent faire l'objet de mises à jour.

1st year

Semester 1

English

Integration, probability and Fourier analysis

Topology

Differential equations

Option 1 -- 1 Choice
Algebra 1
Random and deterministic methods I
Stochastic algorithms
R and Python Software
Numerical methods for PDE 1

3 ECTS

9 ECTS

6 ECTS

3 ECTS

9 ECTS
9 ECTS

Semester 2

Functional Analysis

Differential calculus

Probability complements

Study and research work

Option 1 -- 1 Choice
Body theory and bilinear algebra
Random and deterministic methods II
Operational research
Numerical methods for PDE 2

Option 2 -- 1 Choice
Discovering the teaching profession
Initiation to research

6 ECTS

6 ECTS

3 ECTS

6 ECTS

6 ECTS
6 ECTS

3 ECTS
3 ECTS

2nd year

Semester 3

English (3 ECTS)

Option 1 -- 3 Choices
Analysis complements
Algebra 2
Mathematical analysis of partial differential equations
Numerical analysis *(Engineering school: ISIMA)*
Applied mathematics *(Engineering school: Polytech)*

Option 2 -- 1 Choice
Aggregation preparation 1
Introduction to Research 1

3 ECTS

6 ECTS
6 ECTS
6 ECTS
6 ECTS
6 ECTS

9 ECTS
9 ECTS

Semester 4

Option 1 -- Teaching
Aggregation preparation 2
Preparation for the Agrégation oral exams

Option 2 -- Research
Introduction to Research 2
Reading course

Internship

18 ECTS

18 ECTS

12 ECTS

Stage(s)

Stage(s)

Oui, obligatoires

Informations complémentaires sur le(s) stage(s)

1st year of Master

Several teaching units are carried out in the form of projects. Thus, the 1st year includes a TER consisting of a bibliographical study aimed at elaborating a personal synthesis. The subject is proposed by a teacher-researcher of the laboratory. This activity ends with a written report and an oral presentation.

2nd year of the Master

The 2nd year internship, of a minimum of 3 months, is generally carried out in a laboratory, sometimes in private institutions such as Michelin or CEREMA for example. It involves writing an internship report and an oral presentation.

The internship is an initiative in mathematics research and consists of in-depth reading and synthesis of work on a specific subject. When the topic is applied to numerical analysis, for example, the internship may consist in part of the numerical implementation of an algorithm.

These training courses by and for research aim to familiarize students with the methods of working in an academic environment, in particular teamwork under the direction of an experienced mathematician, bibliographical research and the confrontation of ideas.

Et après ?

Niveau de sortie

Année post-bac de sortie

- Bac +5

Compétences visées

Activités visées / compétences attestées

The Master's program offers numerous practical and experimental situations, in an approach to developing skills that includes the following aspects

- Initiation to research
- Linguistic and scientific skills (via a TER subject for which references in English are mandatory)
- Discovery of teaching

Poursuites d'études

The pursuit of a doctorate is a possibility offered by the Master. The measures put in place aim to encourage further studies and to diversify the thematic offer to meet the needs of the Laboratoire de Mathématiques Blaise Pascal.

The laboratory has 4 teams on various themes allowing each student to make his choice and apply for doctoral grants adapted to his professional project.

Débouchés professionnels

Secteurs d'activité

- Research (public or private)
- Higher education, Secondary education and CPGE
- Mathematical engineering
- Business support
- Industry

The jobs targeted by this training are mainly of 3 types: jobs related to teaching, research and the world of industry:

- Analysis and financial engineering
- Management and engineering studies, research and industrial development
- Associate professor in high school or CPGE
- Lecturer or research fellow in a public institute after preparing a doctoral thesis (as a lecturer)
- Research engineer or researcher in the public or private sector after the preparation of a doctoral thesis

Insertion professionnelle

Survey 2021 _ Class of 2018: 30 months after graduation

- 60% working
- 40% pursuing studies (PhD / teaching preparation)

Survey 2021 _ class of 2020 : less than 1 year after graduation

- 57% working
- 14% looking for a job
- 29% pursuing studies (PhD)