

Master in Mathematics

—
Master académique

—
General Mathematics
Financial Mathematics

A research-centred institution with a personal atmosphere and international, multicultural flair.

A dynamic and multidisciplinary faculty.

University of Luxembourg
Campus Kirchberg



Proceeding to the forefront of knowledge in one of the major fields of Mathematics.

During the last half of the twentieth century, striking applications of Mathematics appeared in all natural, behavioral and social sciences. From Life Sciences (DNA studies) to Information Technologies (cellular phones, microprocessors, the internet, and GPS devices), from Theoretical Physics (fundamental structure of matter, gravitation, cosmos) to Geology (oil reserves), from Medical Technology (computerised axial tomography scanners) to Economics (stochastic and economic

processes, finance markets), Mathematics had an ineradicable imprint on every part of modern science. This "unreasonable effectiveness of pure Mathematics in the natural sciences" is almost a topic by itself. Eminent scientists, Nobel Price Winners and Fields Medalists were joining in the discussion. Most agree that essentially Mathematics is not created but discovered, that it is part of the "nature of the World".

Objectives

The Master in Mathematics at the University of Luxembourg provides a broad education and a strong background in Mathematics. It enables our students to proceed to the forefront of knowledge in one of the major fields of present-day Mathematics. With the expertise gained, graduates will be able to use and adapt mathematical methods, to recognise and analyze mathematical structures, to efficiently communicate mathematical information, and to approach other

areas of knowledge. They will be capable of working collaboratively and functioning professionally in Mathematics related positions.

Since student needs and interests vary, a flexibility is inherent to the curriculum, which allows students to perform the programme following different career perspectives.



Prof Dr Norbert Poncin
(Master in Mathematics)



Prof Dr Anton Thalmaier
(Track "Financial Mathematics")

Direction des études
Course directors

Testimonials

Personal report by a graduate (2010)



Gilles Moris
Secondary School Professor Aspirant

Personal contact between professors and students plays an important part in choosing the Master in Mathematics at the University of Luxembourg. Students at this university find it easy to talk to a professor, ask questions and address problems. This informal atmosphere is only due to the small working groups, but also to the courses offered. For instance, the university offers "reading courses" in which a previously chosen book is discussed in class, promoting dialogue between professor and students and often leading to exciting discussions.

Even before classes begin, the University of Luxembourg is interested in knowing about a student's future plans and takes these into account when planning courses for the master's programme. Students interested in research are offered courses

that cover different fields in pure mathematics. Those who wish to enter into the field of teaching are offered internships in schools and didactics classes, recommendable to all future teachers.

Moreover, the students have a say in the organisation of classes and are given the opportunity to bring their own ideas to the curriculum. Teachers listen to the students' suggestions and thus let them know their views are important.

Personal report by a graduate (2010)



Tiffany Covolo
PhD Student at the University of Luxembourg

The Master in Mathematics at the University is a fairly recent, though much in demand course of studies and one of the few that is taught in English, which I think gives you an edge in research. I chose this masters degree because it offered the exact classes I was looking for. In general, only few students used to choose to do math, therefore universities don't offer a great variety of courses. The University of Luxembourg proved to be flexible and offered courses from very specific fields in math, even when only few students requested these unique courses.

The University took care of all of us well, and it actively supported us in transitioning from studies to a job or scientific career, for example by helping us with internships in secondary schools and banks or contacts with researchers at the University.

A unique environment and an innovative approach to promote interaction and knowledge sharing.



Studying in Luxembourg

The University of Luxembourg, founded in 2003, offers an inspiring international multilingual learning environment with innovative course formats and a high degree of interaction due to small student groups.

As Luxembourg is one of the most important finance places of Europe with increasing needs of highly qualified staff, the Master in Mathematics with the option of Mathematical Finance offered by the University of Luxembourg is unique in this respect. Students can make their internship and Master's thesis in close cooperation with Luxembourg's financial institutions.

Due to close contacts of the Mathematics Research Unit with the secondary education school system in Luxembourg, studying at the University of Luxembourg has considerable advantages for prospective teachers. Special courses in Applied Didactics of Mathematics (partially given by practitioners) and internships in secondary schools in Luxembourg City, aim at coaching students for the entrance examination on the biennial practical work placement.

Career opportunities

The programme is designed for students who wish to prepare for careers related to Mathematics. It enables these students to acquire expertise and professional qualification

- to work in the financial sector
- to work in other private or public sector companies
- to become professors in secondary education
- to work in public research and higher education

Due to attractive options and specialisations, e.g. in Mathematics Education or in Financial Mathematics, along with the practical orientation of the programme (including industrial cooperation and internships in secondary schools, banks or companies in Luxembourg), graduates are well-prepared for a diversified job-market.

For students with the career goal of a secondary school professor, the master's programme offers (together with a bachelor's degree) the required 5-year academic education.

Course programme

The first year of the curriculum concentrates on deepening the mathematical skills. The second year allows a specialisation in different options:

• General Mathematics

This study track focuses on new techniques and concepts of Pure and Applied Mathematics. It provides a high level of mathematical training and facilitates access to a broad spectrum of careers in industry, education, and research. This direction is also intended for prospective secondary school professors. It supplies these students (via optional activities) with a solid theoretical and practical background in Mathematics and Mathematics Education.

• Financial Mathematics

This option intends to prepare students with mathematical skills for a wide range of career opportunities in the financial industry. Special emphasis lies on modern stochastic methods used in areas such as financial modelling, derivatives pricing, hedging, risk management, stochastic optimisation and control.

Programme outline

Duration The programme has a standard duration of 4 terms (2 years – 120 ECTS) and ends with the Master of Science in Mathematics degree.

Language The University of Luxembourg provides a multilingual environment. The language of instruction of the Master in Mathematics is English.

Courses and training strategy The curriculum consists of core courses which are compulsory for all students and others which are compulsory within the chosen specialisation. Besides these restrictions, the highest possible flexibility in choosing optional courses is intended. The training strategies motivate students through an inquiry-based approach. Credits can be obtained not only from lecture courses, but also from reading courses, supervised student projects, student seminars and internships...

Master's Thesis The Master's Thesis is written in a selected area of specialisation during the fourth semester. For students with the specialisation in Financial Mathematics a financial industry internship ("stage") is compulsory. Also, for the General Mathematics option, a Master's Thesis in collaboration with industry is possible. The Master's Thesis may be combined with the internship and (co-) supervised by a member of the institution where the internship is performed.

Start of the programme Each September

Programme evaluation An evaluation by the students of the Master's degree programme in Mathematics is organised each semester.

Application requirements A necessary condition for admission to the programme is a first academic degree (e.g. a Bachelor's degree) in Mathematics or in a related subject.

Application Online registration will be possible on www.uni.lu in the students' section, starting at the beginning of each calendar year. The "Service des Études et de la Vie Étudiante" (SEVE) provides enrolment and individual support to students:

seve.infos@uni.lu
T. + 352 / 46 66 44-6060



Lecture hall at Campus Kirchberg, University of Luxembourg

Contacts

The programme is organised by the Mathematics Research Unit of the University of Luxembourg.

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Updated information about the programme will appear regularly on the homepage of the Master's: <http://mathmaster.uni.lu>

