UCLouvain

MATH2M

2017 - 2018

Master [120] in Mathematics

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In french
Dissertation/Graduation Project : **YES** - Internship : **NO**
Activities in English: **YES** - Activities in other languages : **YES**
Activities on other sites : **NO**
Main study domain : **Sciences**
Organized by: **Faculté des sciences (SC)**
Programme acronym: **math2m** - Francophone Certification Framework: 7

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MATH2M - Introduction

Introduction

Introduction

The Master 120 in Mathematics offers

- a thorough education in cutting-edge fundamental mathematics with an orientation towards either research or teaching;
- an interdisciplinary program in physics, statistics, probability, cryptography, information theory, financial mathematics, actuarial science, etc.;
- the possibility of including advanced courses from other universities within your programme of specialisation;
- teaching based on your personal learning history;
- the opportunity to carry out part of your programme abroad;
- the possibility of moving directly to the second year of the Master in statistics, biostatistics and actuarial science.

Your Profile

You

- have a sense of the precision and rigour of reasoning
- wish to develop your analytical skills and apply your capacity for reasoning and your spirit of abstraction in order to understand, model and solve complex situations in every field of application of mathematics;
- are committed to research and wish to carry out a first project in collaboration with internationally renowned researchers;
- plan to teach mathematics in secondary school and wish to acquire a solid training in fundamental mathematics.

Your Future Job

Whatever his specialisation, the mathematician will be able to exercise his talents in a variety of very different professional sectors and to make the most of the powerful tools he has developed in situations that are often a long way from mathematics.

The disciplinary knowledge and skills of the mathematician can be exploited in fundamental mathematical research and in teaching mathematics. These skills also offer access to many professions in which mathematics interacts with other disciplines (particularly in research laboratories in the climatology sector, in meteorology and in astronomy, in research and development institutes in the biochemistry and pharmacology sectors, in analysis and development departments in the economics sector, in finance and insurance, in computer companies, in cryptography and in telecommunications).

Your Programme

Together with the solid training in fundamental mathematics that will equip you with tools in the main mathematical disciplines, the Master offers the choice of two focuses, depending on whether you are oriented towards research or teaching. In both options, learning is completed by optional courses in your chosen fields in mathematics or in closely related fields (applied mathematics, physics, statistics and biostatistics, actuarial science, computing...).

MATH2M - Teaching profile

Learning outcomes

By the end of the course the student will have acquired the knowledge of the discipline and the transferable skills needed to practise the many professional activities that require substantial mathematical skills: research and teaching, but also highly varied professions in which mathematics interacts with other fields and mathematicians collaborate with people who come from different intellectual backgrounds.

The skills acquired during the course will allow him to adapt to different professional contexts (linked, for example, to economic sciences, to the engineering sciences, to health sciences) and to acquire rapidly the techniques specific to his profession.

The programme offers a general education in the important fields of fundamental mathematics, including recent advanced subjects, and allows the student to deal in depth with closely related fields that have already been introduced in the Bachelor in Mathematics (especially physics, but also statistics, actuarial science, and computing).

Depending on the choice of option, by the end of the course the graduate will also have acquired a deeper knowledge of a field of research (research focus) or the skills required to teach mathematics in secondary schools (teaching focus).

As with any UCL graduate, the graduate Master in Mathematics will be capable of taking a critical, constructive and innovative view of the present-day world and its problems, of acting as a responsible and competent citizen in society and in his professional milieu, of independently acquiring and using new knowledge and skills throughout his professional life, and of managing major projects in all their aspects, both individually and as part of a team.

On successful completion of this programme, each student is able to :

Finalité spécialisée - Grâce aux cours de l'option choisie, les étudiants de deux options auront aussi acquis la capacité d'analyser, en profondeur et sous divers points de vue, un problème mathématique ou un système complexe relevant de disciplines scientifiques autres que les mathématiques, pour en extraire les points essentiels et les mettre en relation avec les outils théoriques les mieux adaptés.

pas d'acquis d'apprentissage détaillés

1) master the disciplinary knowledge and basic transferable skills whose acquisition began in the Bachelor programme. He will have expanded his basic disciplinary knowledge and skills.

• Choose and use the fundamental methods and tools of calculation to solve mathematical problems.
• Recognise the fundamental concepts of important current mathematical theories.
• Establish the main connections between these theories, analyse them and explain them through the use of examples.

2) show evidence of abstract thinking and of a critical spirit.

• Recognise the fundamental concepts of important current mathematical theories.
• Identify the unifying aspects of different situations and experiences.
• Argue within the context of the axiomatic method.
• Construct and draw up a proof independently, clearly and rigorously.

3) communicate in a scientific manner.

• Write a mathematical text in French according to the conventions of the discipline.
• Structure an oral presentation and adapt it to the listeners' level of understanding.
• Communicate in English (level C1 for reading comprehension, level B2 for listening comprehension and for oral and written expression, CEFR).

4) show evidence of independent learning.

• Find sources in the mathematical literature and assess their relevance.
• Correctly locate an advanced mathematical text in relation to knowledge acquired.
• Ask himself relevant and lucid questions on a mathematical topic in an independent manner.

5) analyse a mathematical problem and suggest appropriate tools for studying it in depth

• Rédiger un texte mathématique selon les conventions de la discipline.
• Structurer un exposé oral en l'adaptant au niveau d'expertise des interlocuteurs.

Finalité approfondie - L'étudiant qui se destine à la recherche aura acquis une connaissance plus approfondie d'un ou de plusieurs domaines des mathématiques actuelles et de ses problématiques. Ces connaissances visent à lui permettre d'interagir avec d'autres chercheurs dans le cadre d'une recherche de niveau doctoral.

• Développer de façon autonome son intuition mathématique en anticipant les résultats attendus (formuler des conjectures) et en vérifiant la cohérence avec des résultats déjà existants.
• Se documenter et résumer l'état des connaissances actuelles concernant un problème mathématique.
• Poser de façon autonome des questions pertinentes et lucides sur un sujet avancé de mathématique.
• Analyser un problème de recherche et proposer des outils adéquats pour l'étudier de façon approfondie et originale.

6) **if the research focus is chosen**, begin a research project thanks to a deeper knowledge of one or more fields and their problematic issues in current mathematics. This knowledge aims at allowing the student to interact with other researchers in the context of a research project at doctoral level.

• Develop in an independent way his mathematical intuition by anticipating the expected results (formulating conjectures) and by verifying their consistency with already existing results.
• Gather material and summarise the current state of knowledge relating to a mathematical problem.
• Ask relevant and lucid questions on an advanced mathematical topic in an independent manner.

Finalité didactique - L'étudiant qui se destine à l'enseignement sera prêt à assumer des tâches professionnelles dans l'enseignement secondaire et à apporter ses compétences pédagogiques et disciplinaires.

- Mettre en relation les contenus mathématiques du programme de l'enseignement secondaire et ceux de la formation universitaire.
- Comparer et intégrer différentes approches possibles aux principaux sujets du programme de mathématique de l'école secondaire, identifier les étapes clef et les points délicats du programme.
- Mettre en place des dispositifs d'apprentissage adaptés, originaux et pertinents tant du point de vue de la rigueur que du point de vue de l'intuition.
- Proposer des problèmes provenant de différents domaines permettant d'introduire, illustrer et mettre en œuvre des notions mathématiques du programme.

7) **if the teaching focus is chosen**, bring together the skills needed to successfully begin the career of teacher of mathematics in upper secondary school and to make positive progress.

• Take action in the school setting, in partnership with other involved parties.
• Teach in real and observed situations.

In a more specific way, in regard to the teaching of mathematics, the graduate is able:

- To link the mathematical content of the secondary school teaching programme with that of university education.
- Compare and integrate different possible approaches to the main subjects of secondary school mathematics, identify the key stages and the sensitive points of the programme.
- Employ learning methods that are appropriate, original and relevant both from the point of view of precision and from that of intuition.
- Formulate interdisciplinary examples in the form of problems to introduce, illustrate and put into practice the mathematical concepts of the programme.
- Be self-critical and plan with continuous development in mind. For more details, see Teacher training certificate (upper secondary education) (Mathematics).

Depending on the chosen focus, he will be able to adapt to various professional contexts and he will be able to :

- Do a statistical analysis of large sets of data with the help of softwares.
- Master several fields of current probability and mathematical statistics and their problems.
- Use basic concepts and models in survival analysis, specific tools of biostatistics and techniques and standards of clinical tests.
- Exploit in an integrated way various know-hows in actuarial sciences and in financial mathematics in order to analyse complex problems in quantitative management of risks.
- Use fundamental tools of computing and programming in order to solve management problems involved in the financial impact of risks.

Programme structure

The programme for the Master in Mathematical Sciences is composed of:

- core subjects of 60 credits, of which 26 credits are for the dissertation;
- a focus of 30 credits;
- either one option course of 30 credits or 30 credits from selected courses.

Note here that:

- a part of the programme of study corresponding to around 30 credits (some of which may be involved in writing the dissertation) may be performed in the context of one of the international mobility programmes established by the Faculty.
- Courses already taken as part of the in-depth minor in mathematics may not be included in the student's Master programme
- With the agreement of the School of Mathematics, the student may defer to the second year an activity scheduled for the first year or bring forward to the first year an activity scheduled for the second year (with the exception of LMAT2997 and LMAT2999). In these cases, timetable clashes may arise. For a standard programme, this Master will total, whatever the focus, the options and/or the optional courses chosen, a minimum of 120 credits divided into two annual sections of 60 credits each.

For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.

> Core courses *[en-prog-2017-math2m-lmath220t.html]*

Focuses

> Research focus *[en-prog-2017-math2m-lmath200a]*
> Teaching focus *[en-prog-2017-math2m-lmath200d]*

Options courses

> Option in Statistics *[en-prog-2017-math2m-lmath221o.html]*
> Option sciences actuarielles *[en-prog-2017-math2m-lmath222o.html]*
> Option mathématique avancée *[en-prog-2017-math2m-lmath2230o.html]*

> Option biostatistique *[en-prog-2017-math2m-lmath2240o.html]*

MATH2M Detailled programme

Programme by subject

CORE COURSES [60.0]

O Mandatory
△ Courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018
⊠ Optional
⊘ Periodic courses not taught during 2017-2018
Activity with requisites

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

						Year 1	2
O LMAT2120	Galois theory and groups representtions	Pierre-Emmanuel Caprace Jean-Pierre Tignol	45h+15h	5 Credits	2q	x	
O LMAT2130	Partial differential equations : Poisson and Laplace equations	Augusto Ponce Jean Van Schaftingen	30h+30h	5 Credits	1q	x	
O LMAT2140	Algebraic topology	Pedro Dos Santos Santana Forte Vaz Pascal Lambrechts	45h	5 Credits	2q	x	
O LMAT2150	Category theory	Marino Gran Enrico Vitale	45h	5 Credits	2q	x	
O LMAT2420	Complex analysis 2	Tom Claeys	30h+15h	5 Credits	1q	x	
O LMAT2430	Eléments de théorie de Lie et géométrie riemannienne	Pierre Bieliavsky	30h+15h	5 Credits	1q	x	
O LMAT2997	Thesis tutorial	Pedro Dos Santos Santana Forte Vaz	15h	2 Credits	2q		x
O LMAT2999	Mémoire			26 Credits	2q		x

O *Philosophy (2 credits)*

Students will choose from the following
2 credits to choose between

⊠ LSC2001	Introduction to contemporary philosophy	Vincent Israel-Hoenen (compensates Peter Verdée) Peter Verdée	30h	2 Credits	2q		x
⊠ LSC2220	Philosophy of science	Alexandre Guay	30h	2 Credits	2q		x
⊠ LFILO2003E	Ethics in the Sciences and technics (sem)	Bernard Feltz Hervé Jeanmart René Rezsohazy	15h+15h	2 Credits	2q		x
⊠ LTHEO2840	Science and Christian faith	Benoît Bourgine Bernard Feltz Dominique Lambert	30h	3 Credits	1q △	x	x

⊠ *Cours facultatif : Ingénieux Sud*

Les 5 crédits de cours ne sont pas comptabilisés dans les 120 crédits requis.

⊠ LSST1001	IngénieuxSud	Jean-Pierre Raskin	15h+45h	5 Credits	2q	x	x

LIST OF FOCUSES

> Research focus *[en-prog-2017-math2m-lmath200a]*
> Teaching focus *[en-prog-2017-math2m-lmath200d]*

RESEARCH FOCUS [30.0]

In the research focus, the programme offers a general education in the major fields of fundamental mathematics and a deeper education in one of the research areas of the School of Mathematics. In seminar LMAT2160, a research project is set up by the students. With the agreement of the School, students may replace courses in the research focus by courses in research given in other universities, by courses chosen from the various options, or by courses in the Master in Physics.

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

						Year 1	Year 2
O LMAT2160	Mathematics seminar	Pierre-Emmanuel Caprace Jean Van Schaftingen	15h+30h	6 Credits	1q		x

O Cours approfondis de recherche (24 credits)

⊠ Au moins une UE parmi

Ces UE sont spécialement recommandées aux étudiants qui souhaitent entamer par la suite une thèse de doctorat

⊠ LMAT2210	Algebra	Jean-Pierre Tignol	45h	6 Credits	1q		x
⊠ LMAT2220	Special topics in category theory	Marino Gran Enrico Vitale	45h	6 Credits	2q		x
⊠ LMAT2240	Knot theory and low-dimensional topology	Pedro Dos Santos Santana Forte Vaz Pascal Lambrechts	45h	6 Credits	1q		x
⊠ LMAT2250	Calculus of variations and non linear elliptic equations	Michel Willem	45h	6 Credits	1q		x
⊠ LMAT2260	Compléments d'analyse et de géométrie complexe	Tom Claeys Luc Haine	45h	6 Credits	2q		x

⊠ Unités d'enseignement de recherche donnés par des professeurs visiteurs

⊠ LMAT2910	Advanced topics in mathematics 1	Paolo Roselli	30h	6 Credits	1q		x
⊠ LMAT2920	Advanced topics in mathematics 2	Antonin Monteil	30h	6 Credits	2q		x
⊠ LMAT2930	Advanced topics in mathematics 3	Thorsten Neuschel	30h	6 Credits	1q		x

TEACHING FOCUS [30.0]

IMPORTANT NOTE: In accordance with article 138 para. 4 of the decree of 7 November 2013 concerning higher education and the academic organisation of studies, teaching practice placements will not be assessed in the September session. Students are required to make every effort to successfully complete the teaching practice in the June session, subject to having to retake the year.

In the teaching focus, the programme offers general training for the secondary school teacher and specific training in teaching mathematics. The teaching focus confers on the student the title of qualified teacher for upper secondary education.

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

O Séminaire d'observation et d'analyse de l'institution scolaire et de son contexte (en ce compris le stage d'observation) (4 credits)

Choisir 1 des activités suivantes. Le cours et le séminaire doivent être suivis au même quadrimestre.

					Year 1	Year 2
⊠ LAGRE2120P	Observation et analyse de l'institution scolaire et de son contexte (en ce compris le stage d'observation)	Branka Cattonar (coord.) Vincent Dupriez	22.5h +25h	4 Credits	1q	x	
⊠ LAGRE2120Q	Observation et analyse de l'institution scolaire et de son contexte (en ce compris le stage d'observation)	Branka Cattonar (coord.) Vincent Dupriez	22.5h +25h	4 Credits	2q	x	

O Comprendre l'adolescent en situation scolaire, gérer la relation interpersonnelle et animer le groupe classe (4 credits)

Choisir 1 des activités suivantes. Le cours et le séminaire doivent être suivis au même quadrimestre.

					Year 1	Year 2
⊠ LAGRE2020P	Comprendre l'adolescent en situation scolaire, Gérer la relation interpersonnelle et animer le groupe classe.	James Day Pascale Steyns (coord.)	22.5h +22.5h	4 Credits	1q	x	
⊠ LAGRE2020Q	Comprendre l'adolescent en situation scolaire, Gérer la relation interpersonnelle et animer le groupe classe.	James Day Pascale Steyns (coord.)	22.5h +22.5h	4 Credits	2q	x	
O LMAT2310	Stages d'enseignement en mathématique (en ce compris le séminaire d'intégration des stages)	Christiane Hauchart	15h+40h	7 Credits	1 + 2q	x	x
O LAGRE2400	See specifications in french	Michel Dupuis Anne Ghysselinckx	20h	2 Credits	2q	x	x

O Concevoir, planifier et évaluer des pratique d'enseignement et d'apprentissage (13 credits)

					Year 1	Year 2
O LMAT2320	Didactique et épistémologie de la mathématique	Christiane Hauchart	60h	6 Credits	1 + 2q	x	x

O Didactique et épistémologie d'une autre discipline (en ce compris le stage d'écoute) (4 credits)

Students will choose one course from the following

					Year 1	Year 2
⊠ LGEO2320A	Didactique et épistémologie de la géographie (en ce compris le stage d'écoute)	Marie-Laurence De Keersmaecker	37.5h +10h	4 Credits	1q		x
⊠ LMAT2330	Seminar on the teaching of mathematics	Christiane Hauchart Enrico Vitale	15h+30h	4 Credits	1 + 2q		x
⊠ LSCI2320A	Didactique et épistémologie des sciences	Myriam De Kesel Jim Plumat Valérie Wathelet	37.5h +10h	4 Credits	1q		x

O Didactique générale et formation à l'interdisciplinarité (3 credits)

Une des activités suivantes:

					Year 1	Year 2
⊠ LAGRE2220A	Didactique générale et formation à l'interdisciplinarité	Jean-Louis Dufays Marc Romainville	37.5h	3 Credits	1 + 2q	x	
⊠ LAGRE2220S	Didactique générale et formation à l'interdisciplinarité	Jean-Louis Dufays Marc Romainville	37.5h	3 Credits	2q	x	

OPTIONS [30.0]

Whatever the focus followed, the student completes the programme with 30 credits. In concrete terms, the student must either take an option of 30 credits, or take the 30 credits by choosing them in the various options and focuses, provided they have not already been chosen: - Students in the research focus may choose courses in the different options and in their focus. – Students in the teaching focus may choose courses in the different options and in the research focus, and one course in their focus. In all cases, the choice will be made in agreement with the dissertation supervisor and must be approved by the School.

> Option in Statistics *[en-prog-2017-math2m-lmath221o]*
> Option sciences actuarielles *[en-prog-2017-math2m-lmath222o]*
> Option mathématique avancée *[en-prog-2017-math2m-lmath2230o]*
> Option biostatistique *[en-prog-2017-math2m-lmath2240o]*

OPTION IN STATISTICS [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

UCL graduates in the Master in Mathematics with option in general statistics have direct access to the second year of the Master in Statistics with orientation in general statistics.

						Year 1	2
O LSTAT2040	Statistical analysis	Benjamin Colling (compensates Ingrid Van Keilegom) Benjamin Colling (compensates Anouar El Ghouch) Anouar El Ghouch Anouar El Ghouch (compensates Ingrid Van Keilegom) Ingrid Van Keilegom	30h+15h	5 Credits	2q	x	
O LSTAT2020	Statistical computing	Céline Bugli (compensates Bernadette Govaerts) Bernadette Govaerts	20h+20h	6 Credits	1q	x	
O LSTAT2110	Data Analysis	Johan Segers	22.5h +7.5h	5 Credits	1q	x	
O LSTAT2120	Linear models	Christian Hafner	30h+7.5h	5 Credits	1q	x	
O LSTAT2140	Non parametric statistics	Cédric Heuchenne (compensates Ingrid Van Keilegom) Ingrid Van Keilegom	15h+5h	4 Credits	1q	x	

O Cours au choix

Students will choose one course from the following

⊠ LMAT2470	Processus stochastiques (statistique)	Donatien Hainaut	30h	5 Credits	2q	x	
⊠ LSTAT2050	Analyse statistique II	Marc Hallin Rainer von Sachs	30h+15h	5 Credits	1q		x

OPTION SCIENCES ACTUARIELLES [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

UCL graduates in the Master in Mathematics who have taken courses LINMA2725, LACTU2010, LACTU2020 and LACTU2030 and who in addition have followed at least 3 courses from LACTU2040, LACTU2060, LACTU2070 and LACTU2080 have access to the second year of the Master in Actuarial Science.

						Year 1	Year 2
⊠ LACTU2020	Fixed income mathematics	Pierre Devolder	30h+15h	5 Credits	1q	x	
⊠ LACTU2030	LIFE INSURANCE 1	Pierre Devolder Françoise Gilles (compensates Donatien Hainaut) Donatien Hainaut	30h+15h	5 Credits	1q	x	
⊠ LACTU2070	STOCHASTIC FINANCE 1	Donatien Hainaut	30h	5 Credits	2q	x	
⊠ LACTU2010	NON LIFE INSURANCE 1	Sébastien de Valeriola (compensates Michel Denuit) Michel Denuit	30h+15h	5 Credits	1q	x	
⊠ LACTU2040	PENSION FUNDING	Pierre Devolder	30h+15h	5 Credits	2q	x	
⊠ LACTU2060	LIFE INSURANCE 2	Michel Denuit Donatien Hainaut Julien Trufin (compensates Michel Denuit)	30h	5 Credits	2q	x	
⊠ LACTU2080	Reinsurance	Michel Denuit Jean-François Walhin (compensates Michel Denuit)	30h	5 Credits	2q	x	
⊠ LINMA2725	Financial mathematics	Pierre Devolder	30h +22.5h	5 Credits	1q	x	

OPTION MATHÉMATIQUE AVANCÉE [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

						Year 1	Year 2
⊠ LMAT2410	Partial differential equation : heat equation, brownian moves and numerical aspects	Augusto Ponce Jean Van Schaftingen	30h+15h	5 Credits	2q	x	
⊠ LMAT2440	Number theory	Olivier Pereira Jean-Pierre Tignol	30h+15h	5 Credits	1q	x	
⊠ LMAT2450	Cryptography	Olivier Pereira	30h+15h	5 Credits	1q	x	
⊠ LMAT2460	Finite mathematics and combinatorial structures	Jean-Charles Delvenne Jean-Pierre Tignol	30h	5 Credits	1q	x	
⊠ LSTAT2040	Statistical analysis	Benjamin Colling (compensates Ingrid Van Keilegom) Benjamin Colling (compensates Anouar El Ghouch) Anouar El Ghouch Anouar El Ghouch (compensates Ingrid Van Keilegom) Ingrid Van Keilegom	30h+15h	5 Credits	2q	x	
⊠ LINMA2380	Matrix computations	Raphaël Jungers	30h +22.5h	5 Credits	1q	x	
⊠ LINMA1170	Numerical analysis	François Henrotte (compensates Jean-François Remacle) Jean-François Remacle	30h +22.5h	5 Credits	1q	x	
⊠ LPHY2111	Introduction à la dynamique non linéaire	Christian Hagendorf	30h+15h	5 Credits	1q	x	

OPTION BIOSTATISTIQUE [30.0]

O Mandatory	⊠ Optional
△ Courses not taught during 2017-2018	⊘ Periodic courses not taught during 2017-2018
⊕ Periodic courses taught during 2017-2018	Activity with requisites

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

UCL graduates in the Master in Mathematics with option in general statistics have access to the second year of the Master in Statistics with biostatistics orientation. Students will choose one course between LSTAT2130 and LSTAT2220. Students will choose one course from the following

						Year 1	Year 2
O LSTAT2020	Statistical computing	Céline Bugli (compensates Bernadette Govaerts) Bernadette Govaerts	20h+20h	6 Credits	1q	x	
O LSTAT2040	Statistical analysis	Benjamin Colling (compensates Ingrid Van Keilegom) Benjamin Colling (compensates Anouar El Ghouch) Anouar El Ghouch Anouar El Ghouch (compensates Ingrid Van Keilegom) Ingrid Van Keilegom	30h+15h	5 Credits	2q	x	
O LSTAT2110	Data Analysis	Johan Segers	22.5h +7.5h	5 Credits	1q	x	
O LSTAT2120	Linear models	Christian Hafner	30h+7.5h	5 Credits	1q	x	
O LSTAT2330	Statistics in clinical trials.	Catherine Legrand Annie Robert	22.5h +7.5h	5 Credits	2q	x	
O *Une unité d'enseignement parmi*							
⊠ LSTAT2130	Introduction to Bayesian statistics	Philippe Lambert	15h+5h	4 Credits	2q	x	
⊠ LSTAT2220	Analysis of survival and duration data	Ingrid Van Keilegom	15h+5h	4 Credits	1q	x	

Course prerequisites

A document entitled (nb: not available for this programme math2m) 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 UCL 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?"

MATH2M - Information

Admission

General and specific admission requirements for this program must be satisfied at the time of enrolling at the university..

SUMMARY

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Specific Admission Requirements

En plus de remplir les conditions d'accès décrites ci-dessous, les candidats devront apporter la preuve d'une maîtrise suffisante de la langue française (niveau B1 du CECR (Cadre européen commun de référence) .

Les étudiants désirant accéder à la finalité didactique doivent apporter la preuve d'une maîtrise de niveau C1 du CECR.

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
		Direct Access	
Bachelor in Physics	Si l'étudiant a suivi la Code inconnu:minmath	Direct Access	
Bachelor in Engineering	Si l'étudiant a suivi la Code inconnu:minmath ou si l'étudiant a suivi le programme de majeure en mathématiques appliquées	Direct Access	
Others Bachelors of the French speaking Community of Belgium			
		Direct Access	
Bachelors of the Dutch speaking Community of Belgium			
		Direct Access	
Foreign Bachelors			
		Based on application: accepted, conditional on further training, or refusal	

Non university Bachelors

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
		Direct Access	
Masters			

Direct Access

Holders of a non-University 2nd cycle degree

Adults taking up their university training

> See the website Valorisation des acquis de l'expérience (https://uclouvain.be/fr/etudier/vae)
It is possible to gain admission to all masters courses via the validation of professional experience procedure.

Access on the file

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

Admission and Enrolment Procedures for general registration

Teaching method

Whenever possible, teachers in the School of Mathematics give priority to close supervision: small-group work, individual tuition, rapid and personalised feedback on activities, active participation of students in the School's teaching decisions. All the courses in the programme contribute to the acquisition of skills such as the capacity for abstract thinking and for reasoning. Other skills (aptitude for communication, independent learning, document research) are especially exercised in seminars specific to the focuses (where students are responsible for work progress), in work linked to the preparation of the dissertation and in the dissertation activity (the Thesis Tutorial, which specifically concentrates on scientific communication in English). The interdisciplinary character of the programme is reinforced by the presence in the options of courses taken from the Masters programmes in physics, in statistics and biostatistics, in actuarial science and in applied mathematics.

Students in the research focus may take introduction to research courses in neighbouring universities in order to learn about mathematical research subjects that are not offered by UCL. An additional teaching module in disciplines other than mathematics is possible for students in the teaching focus.

Evaluation

The evaluation methods comply with the regulations concerning studies and exams (https://uclouvain.be/fr/decouvrir/rgee.html). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Assessment methods conform to academic regulations and procedures. More details on the methods employed in each teaching unit are available in their description sheet, under the heading 'Assessment methods for student learning'.

Different methods are in place in order to evaluate the knowledge and skills acquired in the course of the learning period; these are adapted to the following types of performance: continuous assessment, especially for practical exercises; assessment of individual work (reading, consultation of databases and bibliographical references, monograph and report writing); overall assessment (written and/or oral) during examination sessions; assessment of public presentations.

Whatever the teaching language of an activity, students may choose to present the corresponding assessment in English or in French. Exceptions are the Thesis Tutorial, philosophy courses and activities specific to the teaching focus.

Mobility and/or Internationalisation outlook

Students in the two focuses will have the opportunity of making an Erasmus, Mercator or other study period. The aim of such a study period is either to follow around 30 course credits, or to write the dissertation, while at the same time having the chance to discover another country and a different culture.

For students in the teaching focus it is preferable for the study period to take place at the end of the year. Partner universities are located in Dutch-speaking Belgium (in this case, the entire second year of the Master may take place outside UCL), in Europe (Italy, Spain, France, Denmark), in Australia, in Canada, in South Africa and in Japan. See https://uclouvain.be/fr/facultes/sc/programmes-d-echange-d-etudiants.html (https://uclouvain.be/fr/facultes/sc/programmes-d-echange-d-etudiants.html) for a detailed presentation of the international mobility activities organised by the Faculty of Sciences. Courses LMAT2910 - Advanced topics 1, LMAT2920 - Advanced topics 2 and LMAT2930 - Advanced topics 3 are given by visiting professors from various Belgian and foreign institutions.The titles of these courses are generic in order to maintain the greatest flexibility and the best match with the development of research.

These courses are often taught in English.

Possible trainings at the end of the programme

Whatever the focus, the Master in Mathematics gives access to the doctorate in science.

The general statistics, biostatistics, and actuarial science options allow access to the second year of the corresponding Master, with a possible additional maximum of 15 credits in the second year programme of the corresponding Master.

Students who have earned a Master's degree in one of the focuses may gain a second Master in Mathematics in the other focus by means of a personalised one-year programme.

Contacts

Attention, you are currently reading an archived page: below contact informations were for program study 2017-2018 only. To get current contact informations please got to current program study site.

Curriculum Management

Entity

Structure entity	SST/SC/MATH
Denomination	(MATH) (https://uclouvain.be/repertoires/entites/math)
Faculty	Faculty of Science (SC) (https://uclouvain.be/repertoires/entites/sc)
Sector	Sciences and Technology (SST) (https://uclouvain.be/repertoires/entites/sst)
Acronym	MATH
Postal address	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
Web site	https://uclouvain.be/fr/facultes/sc/math (https://uclouvain.be/fr/facultes/sc/math)

Academic supervisor: Luc Haine

Jury

- Tom Claeys
- Pedro Vaz

Useful Contact(s)

- Viviane Libois
- Julie Genbrugge

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