



ACTU2M - Introduction

Introduction

2.3

Maîtriser un socle de savoirs en sciences actuarielles et en finance mathématique lui permettant d'appréhender et de résoudre les problèmes actuels tout en développant de manière autonome les nouvelles connaissances nécessaires pour rester compétent tout au long de sa vie professionnelle.

2.4

Articuler des savoirs des différentes disciplines connexes (calcul des probabilités, statistique, droit, économie, comptabilité, fiscalité, etc.) afin de concevoir, individuellement et en équipe, des procédés de gestion de l'impact financier des risques, de les réaliser et de les communiquer aux parties prenantes.

2.5

Comprendre les enjeux de l'intégration des marchés, de la mondialisation et du développement durable, ainsi que le rôle joué par les experts universitaires dans ce cadre.

3.

Contribuer, en équipe, à la réalisation d'un projet en tenant compte des objectifs poursuivis, des ressources allouées et des contraintes qui le caractérisent, et en communiquer les résultats de manière claire, précise et rigoureuse.

3.1

Fonctionner dans un cadre pluridisciplinaire, collaborant avec des collègues d'autres formations avec différents points de vue.

3.2

Exprimer un message de façon claire et structurée, tant à l'oral qu'à l'écrit, en s'adaptant au public visé et en respectant les standards de communication propres au domaine.

3.3

Interagir et dialoguer efficacement avec des interlocuteurs variés, notamment les associations de consommateurs et les pouvoirs publics.

Programme structure

The master's program is structured as follows:

A possible upgrade based on the learner's previous training.

A core curriculum covering the specific aspects of actuarial science, including the financial valuation of actuarial liabilities and the actuarial mathematics of life, property and liability insurance. These courses are organised into two blocks, one devoted to the mathematical elements of insurance and the other to data science techniques applied to insurance.

A professional focus covering insurance mathematics, financial analysis of insurance commitments, asset liability management (ALM), quantitative risk management (QRM) and enterprise risk management (ERM), as well as cross-disciplinary courses on the annual accounts of insurance companies and the solvency of financial institutions.

Detailed programme by subject

CORE COURSES [64.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

1 2

o Mémoire au choix (15 credits)

⊗ LACTU2900	Master thesis : research ■		(FR) [q1 or q2] [] [15 Credits] 🌐		X
⊗ LACTU2910	Master Thesis : Project ■		(FR) [q1 or q2] [] [15 Credits] 🌐		X

o Mathématiques de l'assurance (27 credits)

○ LACTU2010	Property and casualty insurance actuarial science	Michel Denuit	(FR) [q1] [45h] [7 Credits] 🌐		X
○ LACTU2030	Life insurance actuarial science	Donatien Hainaut	(FR) [q1] [30h+7.5h] [5 Credits] 🌐		X
○ LACTU2040	Social security and pension actuarial science	Pierre Devolder	(FR) [q2] [30h+7.5h] [5 Credits] 🌐		X
○ LACTU2170	Financial valuation of actuarial liabilities	Donatien Hainaut	(FR) [q2] [45h+15h] [7 Credits] 🌐		X
○ LACTU2280	Reinsurance and risk exchanges	Philippe De Longueville	(FR) [q1] [15h] [3 Credits] 🌐		X

o Data science (22 credits)

○ LSTAT2020	Statistical softwares and basic statistical programming	Céline Bugli	(FR) [q1] [15h+15h] [4 Credits] 🌐		X
○ LACTU2150	Statistical analysis of insurance data	Arim Barigou	(FR) [q1] [30h] [5 Credits] 🌐		X
○ LACTU2160	Actuarial methods for segmentation	Michel Denuit	(FR) [q1] [45h] [7 Credits] 🌐		X
○ LDATS2310	Deep learning for Insurance and Finance				

PROFESSIONAL FOCUS [30.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
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- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2

○ **Content:**

○ LACTU2210	Quantitative Risk Management	Christian Hafner	EN [q2] [30h] [5 Credits] 🌐 > French-friendly	X
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LDATS2360

OPTIONAL COURSES

Course prerequisites

The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

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

Prerequisites and student's annual programme

As the prerequisite is for CU registration purposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the [Academic Regulations and Procedures](#).

Prerequisites list

LACTU2900 "Mémoire recherche" has prerequisite(s) LACTU2010 ET LACTU2030 ET LACTU2230 ET LACTU2170

- LACTU2010 - [Property and casualty insurance actuarial science](#)
- LACTU2030 - [Life insurance actuarial science](#)
- LACTU2230 - [Health insurance actuarial science](#)
- LACTU2170 - [Financial valuation of actuarial liabilities](#)

LACTU2910 "Mémoire projet" has prerequisite(s) LACTU2010 ET LACTU2030 ET LACTU2230 ET LACTU2170

- LACTU2010 - [Property and casualty insurance actuarial science](#)
- LACTU2030 - [Life insurance actuarial science](#)
- LACTU2230 - [Health insurance actuarial science](#)
- LACTU2170 - [Financial valuation of actuarial liabilities](#)

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.

ACTU2M - Information

Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

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

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

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- > [Specific access requirements](#)
- > [University Bachelors](#)
- > [Non university Bachelors](#)
- > [Holders of a 2nd cycle University degree](#)
- > [Holders of a non-University 2nd cycle degree](#)
- > [Access based on validation of professional experience](#)
- > [Access based on application](#)
- > [Admission and Enrolment Procedures for general registration](#)

Specific access requirements

In addition to fulfilling the access conditions described below, candidates must provide proof of a sufficient command of the French

Others Bachelors of the French speaking Community of Belgium

Bachelor in Business Engineering Bachelor in Engineering Bachelor in Engineering: Architecture Bachelor in Mathematics Bachelor in Physics	Direct access
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Bachelors of the Dutch speaking Community of Belgium

Bachelor in ingenieurswetenschappen, oriëntatie civieltechniek Bachelor in de wiskundige wetenschappen Bachelor in de fysische wetenschappen	Access based on application
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Foreign Bachelors

Bachelor in Business Engineering Bachelor in Engineering Bachelor in Mathematics Bachelor in Physics	Access based on application
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Non university Bachelors

> Find out more about [links](#) to the university

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
"Licenciés" in Engineering, Mathematics, Physics, Statistics		Direct access	
Masters			
Master in Business engineering Master in Biomedical Engineering Master in Chemical and Materials Engineering Master in Civil Engineering Master in Computer Science and Engineering Master in Electrical Engineering Master in Electro-mechanical Engineering Master in Mathematical Engineering Master in Mechanical Engineering Master in Physical Engineering Master in Mathematics Master in Physics Master in Statistics		Direct access	
Master in Management Master in Economics Master in Computer Science	Direct access if they have completed the Minor in Statistics, Actuarial Sciences and Data Sciences .	-	In some cases, the UCLouvain Enrolment Office, after reviewing your online enrolment or re-enrolment application, will ask you to provide an enrolment authorisation from your faculty/ school.

Holders of a non-University 2nd cycle degree

Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about [Validation of priori experience](#).

Entry to all Masters (with the exception of Advanced Masters) can be gained through the special procedure for accrediting prior learning and experience known as VAE (validation des acquis de l'expérience).

Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

Foreign students who have completed a university education (minimum 3 years) with strong quantitative connotation and who have obtained at least 70% (or 14/20) of average for all successful university years in their home university, without the slightest failure in mathematics courses, calculation of probabilities and statistics, have the possibility to apply for admission to the program of the Master in Actuarial Science (120 ECTS).

Specific professional rules

Graduates of UCLouvain's ACTU2M program have direct access to the Belgian professional association (Institut des Actuairens en Belgique - IABE, www.iabe.be) and are authorized to use the title of actuary.

The ACTU2M program is certified as Global Center of Insurance Excellence (GCIE) by the International Insurance Society (IIS), recognizing universities and colleges with outstanding Risk Management and Insurance programs. It ranks in the top 5 worldwide, both in terms of education and fundamental research in actuarial science.

Teaching method

In addition to strong methodological contents, the cursus includes case studies, personal projects and an internship (optional) in an insurance or reinsurance company, consulting firm, pension fund.

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".

Depending on the course, the exam may be oral or written and may include a personal project. The master thesis is defended publicly.

Mobility and/or Internationalisation outlook

If they wish, students can include in their program specialized courses from the actuarial sciences programs at ULB and KU Leuven.

Students can carry out their internship in a company abroad (Luxembourg, London or Paris, for example). Given the high degree of specialization of the Master's program, with no equivalent abroad, international mobility within the framework of the Master's degree in actuarial sciences is limited to the internship.

Since its creation in 1939, the Institute of Actuarial Sciences, which has today joined the School of Statistics, Biostatistics and Actuarial Sciences (LSBA) within the Faculty of Sciences of UCLouvain, has awarded a significant number of degrees to students from French-speaking Africa and Latin America as well as a significant number of students from the European Union. UCLouvain thus trained the first actuaries from several emerging countries, who now actively contribute to local economic development. In addition, UCLouvain professors regularly participate in training programs abroad.

Finally, let us mention that, in recent years, foreign students (Canadians, in particular) are regularly welcomed into the actuarial sciences program for a semester as part of international exchanges.

Possible trainings at the end of the programme

Advanced Masters

The Master in Actuarial Science is not a requirement for any particular Advanced Masters.

Doctoral programme

Holders of a Master in Actuarial Science may enrol for the doctoral programme in Actuarial Science, subject to some conditions (e.g. higher level pass).

Certificates

In addition to the master in actuarial science, CPD activities are organized as University certificates, under the auspices of the University Institute for Continuing Education (Institut universitaire de formation continue - IUFC).

Contacts

Curriculum Management

Entity

Structure entity	SST/SC/LSBA
Denomination	(LSBA)
Faculty	Faculty of Science (SC)
Sector	Sciences and Technology (SST)
Acronym	LSBA
Postal address	Voie du Roman Pays 20 - bte L1.04.01 1348 Louvain-la-Neuve

Tel: [+32 \(0\) 10 47 43 14](tel:+32210474314) - Fax: [+32 \(0\) 10 47 30 32](tel:+32210473032)
<https://uclouvain.be/fr/facultes/sc/lsba>

Website

Academic supervisor: [Michel Denuit](#)

Jury

- President: [Donatien Hainaut](#)
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- Study advisor: [Michel Denuit](#)

Useful Contact(s)

- Secretary of The Louvain School of Statistics, Biostatistics and Actuarial Sciences: [Sophie Malali](#)

