



## ACTU2M - Introduction

### Introduction

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## ACTU2M - Teaching profile

### Learning outcomes

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Graduates of the master's degree in actuarial sciences will be able to design and implement, using a scientific and multidisciplinary approach, processes for managing the financial impact of risks (Quantitative Risk Management) faced by economic agents.

During his training, the future graduate of the master's degree in actuarial sciences will acquire solid methodological foundations but also know-how thanks to tutorials, practical case studies and an obligatory internship in a company or in a research laboratory.

The future graduate of the master's degree in actuarial sciences will thus acquire the knowledge and skills necessary to become:

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## 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

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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.

The curriculum is completed by a master thesis coupled with an internship in a company or within a university research team.

Optional courses: a wide range of elective courses allowing each student to delve deeper into various subjects linked to the desired professional orientation, ranging from additional mathematics to insurance law. Students also have the option of taking advanced courses at one of the other two universities training future actuaries in Belgium (KU Leuven and ULB).. The courses concerned will most often be taught in English (as indicated by their title).

Students establish a 120-credit program including a compulsory common core (69 credits), a specialized focus (30 credits) and elective courses (21 credits). The common core includes compulsory courses, additional courses set by the Jury according to the diploma giving access to the master's degree in actuarial sciences, and a dissertation coupled with an internship in a company or within a research laboratory. The specialized focus includes advanced courses in actuarial sciences and related disciplines. Elective courses will be selected based on the student's professional goals.

## 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					
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**PROFESSIONAL FOCUS [30.0]**

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- 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, ...)

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

Year

1 2

**o Content:**

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○ LACTU2210	Quantitative Risk Management	Christian Hafner	EN [q2] [30h] [5 Credits]
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## OPTIONAL COURSES

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- 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...)

*These credits are not counted within the 120 required credits.*

Year

1 2

### Content:

⊗ LSST1001	IngénieursSud	Stéphanie Merle Jean-Pierre Raskin	(FR) [q1+q2] [15h+45h] [5 Credits] 🌐
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## Course prerequisites

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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

## 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

- > [General access requirements](#)
- > [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	<a href="#">Access based on application</a>
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**Foreign Bachelors**

Bachelor in Business Engineering Bachelor in Engineering Bachelor in Mathematics Bachelor in Physics	<a href="#">Access based on application</a>
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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
<b>"Licenciés"</b>			
"Licenciés" in Engineering, Mathematics, Physics, Statistics		Direct access	
<b>Masters</b>			
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 <a href="#">Minor in Statistics, Actuarial Sciences and Data Sciences</a> .	-	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).

Moreover students who wish to be admitted on the basis of a dossier are invited to consult the [criteria for the evaluation of application](#).

## **Admission and Enrolment Procedures for general registration**

Students must draw up their individual programmes and submits it to the Jury who is responsible for accrediting prior learning and experience.

## Specific professional rules

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Graduates of UCLouvain's ACTU2M program have direct access to the Belgian professional association (Institut des Actuairens en Belgique - IABE,

Entity

Structure entity SST/SC/LSBA  
Denomination (LSBA)  
Faculty Faculty of Science (SC)  
Sector Sciences and Technology (SST)  
Acronym LSBA  
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1348 Louvain-la-Neuve

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

Website

Academic supervisor: [Michel Denuit](#)

Jury

- President: [Donatien Hainaut](#)
- Secretary of the jury: [karim.barigou@uclouvain.be](mailto:karim.barigou@uclouvain.be)
- Study advisor: [Michel Denuit](#)

Useful Contact(s)

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

