



# Master of science (MSc) in Actuarial science

## GENERAL OUTLINE

### Objectives

This Master's degree offers a complete basic education for future actuaries and risk managers. An actuary is a business professional who deals with the financial impact of risk and uncertainty, typically in insurance firms and pension funds.

Most of the subjects taught involve applied mathematics, the actuary's most important working tool. Good knowledge of management, finance, economics, data analytics and information technology is also necessary to ensure an adequate level of professional expertise.

This program fulfills the requirements of the syllabus of the Swiss Association of Actuaries (SAA) and prepares students to some exams of the Institute and Faculty of Actuaries (UK) and of the Society of Actuaries (US).

### Career prospects

University studies develop many transversal skills: oral and written communication, critical, analytical and summarising faculties, abilities in research, etc.

This panoply of skills, combined with specialist knowledge acquired in the course of studies, is an excellent preparation for a wide range of employment opportunities in financial sectors:

- Insurance companies
- Banks
- Consulting firms
- Pension funds
- Regulatory authorities
- Social security institutions

## GENERAL INFORMATION

### Organizer

HEC Lausanne: [www.unil.ch/hec](http://www.unil.ch/hec)  
Department of Actuarial Science (DSA):  
[www.unil.ch/dsa](http://www.unil.ch/dsa)

### Degree awarded

Master of Science (MSc)  
in Actuarial Science  
Maîtrise universitaire ès Sciences  
en sciences actuarielles

### ECTS credits

120

### Duration

4 semesters

### Teaching language

English. Recommended level: C1.

### Academic advisor

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### Additional information

[www.unil.ch/hec/masters](http://www.unil.ch/hec/masters)



Version: February 2023  
Subject to changes.  
Only the official texts should be considered binding.

## EDUCATIONAL CONTENT

### Description

From the first to the third semester, students follow compulsory and optional courses in the main areas of actuarial science.

In the first semester, all students must attend a set of six compulsory courses.

In the second semester, students gain knowledge of actuarial mathematics for life assurance, risk theory, modeling distributions of claims/losses, social security, simulation and advanced probability theory.

In the third semester, students gain knowledge of actuarial mathematics for life assurance, advanced actuarial modeling, credibility theory, insurance accounting, asset management and risk management, analysis of results and international social protection.

The fourth semester is dedicated to the Master's thesis. The student may opt for a research thesis or an internship thesis.

### Mobility

During their third semester, students may study in a university recognised by UNIL, under a mobility exchange programme. They may get a maximum of 30 credits in another institution.

## SYLLABUS\*

### 1<sup>st</sup> semester

Compulsory courses

- Probability and Stochastic Processes
- Quantitative Methods for Actuaries
- Mathematics of Compound Interest
- Insurance Economics
- Principles of Finance
- Computational Tools for Actuaries

**30 ECTS credits**

### 2<sup>nd</sup> semester

Compulsory courses

- Risk Theory
- Loss Models
- Life Contingencies I
- Ratemaking & Claims Reserving
- Social Insurance

**24 ECTS credits**

### 3<sup>rd</sup> semester

Compulsory courses

- Asset and Liability Management for Actuaries
- Life Contingencies II
- Credibility Theory
- Life Insurance Actuarial Controlling
- Actuarial Modelling

**24 ECTS credits**

Optional credits

- Simulation Methods in Finance & Insurance
- Programming
- Time Series
- Analytics Accounting
- Blockchain & Distributed Ledgers
- Insurance Analytics
- Investments
- Mathématiques des caisses de pension
- Prévoyance professionnelle suisse
- Topics in Finance

**6 ECTS credits per semester**

### 4<sup>th</sup> semester

Academic or internship Master thesis

**30 ECTS credits**

\* the official study plan prevails.

## GENERAL INFORMATION

### Admission requirements

A Bachelor's degree from a Swiss university in Economics, Management, Finance, Information Systems or Mathematics.

Another degree or university qualification may be judged equivalent and give access to the Master's program, with or without conditions.

### Enrolment and final dates

The candidate's application must be submitted to the UNIL Admissions Department before 30<sup>th</sup> April: [www.unil.ch/immat](http://www.unil.ch/immat)

Candidates needing a study visa: 28<sup>th</sup> February

### Start of courses

Mid-September.  
Academic calendar: [www.unil.ch/central/calendar](http://www.unil.ch/central/calendar)

### Part-time Master's degree

Under certain conditions, this Master's program can be followed part-time: [www.unil.ch/formations/master-temps-partiel](http://www.unil.ch/formations/master-temps-partiel)

### General information on studies

[www.unil.ch/soc](http://www.unil.ch/soc)

### Career prospects

[www.unil.ch/perspectives/unil-et-apres](http://www.unil.ch/perspectives/unil-et-apres)  
[www.heccareercenter.ch](http://www.heccareercenter.ch)

### Accommodation and financial assistance

[www.unil.ch/sasme](http://www.unil.ch/sasme)

### International

[www.unil.ch/international](http://www.unil.ch/international)



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