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## Master of science in Molecular Life sciences

### GENERAL OUTLINE

#### Objectives

The Master of Science in Molecular Life Sciences is intended for students who are curious, motivated, and enthusiastic about the exploration of life through the application of methods in experimental biology.

The Master program offers in-depth training in the areas of molecular genetics, genomics, cell and developmental biology. We propose in particular specialised courses on the interactions of molecules within networks that control the life of micro-organisms, plants, animals and man. Considerable attention is dedicated to the learning and application of advanced techniques in genome sequencing and annotation. The course also includes instruction in scientific writing.

#### Career prospects

The curriculum offers advanced training in cutting-edge experimental biology and in scientific communication, which is ideal for a number of career prospects including:

- Academic research
- Pharmaceutical industry
- Diagnostic and biomedical research
- Swiss Federal research stations
- Biotechnology firms
- Environmental technologies

### GENERAL INFORMATION

#### Organiser

School of Biology,  
Faculty of Biology and Medicine:  
[www.unil.ch/ecoledebiologie](http://www.unil.ch/ecoledebiologie)

#### Degree awarded

Master of Science (MSc) in Molecular Life Sciences

#### ECTS credits

90

#### Duration

3 semesters

#### Teaching language

English

#### Enrolment

Applications must be submitted on time to the Admissions Department:  
[www.unil.ch/immat](http://www.unil.ch/immat)

#### Contact

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Subject to changes  
(only the official texts are authentic)  
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[www.unil.ch/masters](http://www.unil.ch/masters)

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Faculté de biologie  
et de médecine

## EDUCATIONAL CONTENT

### Description

During the first semester, the students learn to approach a problem individually and as a group with multidisciplinary tools. All students participate in the sequencing of a genome and scientific communication. Optional classes provide a solid knowledge in molecular genetics, cellular and developmental biology, genomics, bioinformatics and biotechnology. An initial placement in a laboratory, participation in seminars and an introduction to bibliographical work complete the programme in terms of research work.

In the second semester, students use the techniques of comparative genomics to annotate a de novo sequenced genome. They also draft an application for a research subsidy. The degree offers a wide range of optional courses including the possibility of choosing certain Masters courses in Behaviour, Evolution and Conservation as well as courses in Bioinformatics at the University of Geneva. Depending on which courses are chosen, students can specialise in the following research fields: Genomics, Bioinformatics, Plant Biology, Microbiology and Metabolism. Students begin their personal research work.

This research work is continued in the third semester and constitutes the basis of a written dissertation defended orally to a panel of examiners.

### Specialisation in Bioinformatics

As part of the Master of Science in Molecular Life Sciences, for students with a particular interest in Bioinformatics, the Universities of Geneva and Lausanne have teamed up to offer a specialised curriculum. These students will follow the same compulsory courses as other students on the Master of Science in Molecular Life Sciences while their optional courses will focus on Bioinformatics.

### Examinations

Courses in the first semester are subject either to continuous assessment or written and/or oral examinations. Questions are often broad-based and refer to the subject matter of more than one course. A practical mark is also given for introductory research work.

For the second semester, examinations are continuous, following directly after the different teaching blocks. They may be oral, written or practical.

Masters work includes a written dissertation which must be defended orally. A practical mark is also taken into account in the final calculation to determine the success of this work.

### Mobility

Students registered for a Master's degree cycle may complete a part of their studies in a partner institution recognised by the UNIL.

After approval of the mobility study programme by the School of Biology and successful completion of the relevant examinations, the credits earned are validated and incorporated in the student's degree curriculum.

### Skills development

University studies develop, in addition to specific academic skills, a great many transverse skills such as: oral and written communication, critical, analytical and summarising faculties, abilities in research, the learning and transmission of knowledge, independence and the ability to make judgments in the field of specialisation and overlapping areas.

This panoply of skills, combined with specialist knowledge acquired in the course of studies, is excellent preparation for a wide range of employment opportunities and economic sectors, such as those mentioned in the Career prospects.

## SYLLABUS

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

Common activities: sequencing of a genome and scientific authoring work

Optional classes in:

- Microbiology
- Plant Biology
- Biotechnology
- Developmental Biology
- Bioinformatics and Systems Biology

Personal Research Project (introduction)

**30 ECTS credits**

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

Common activities: annotation of a genome and scientific writing.

Optional classes in:

- Genomics
- Plant Biology and Biochemistry
- Developmental Biology
- Signals and Gene Regulation
- Microbiology
- Bioinformatics

Start of Personal Research Project

**30 ECTS credits**

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

Personal Research Project

- Continuation and Conclusion of Research Project

**30 ECTS credits**

## PRACTICAL INFORMATION

### Admission requirements

Candidates must hold a Bachelor of Science in Biology or in a field considered to be equivalent, awarded by a Swiss university. Another degree or academic title may be judged equivalent and give access to the Master's degree programme, with or without further conditions.

### Regulations and additional information concerning the course

Web site of the School of Biology: [www.unil.ch/ecoledbiologie/page80029.html](http://www.unil.ch/ecoledbiologie/page80029.html)

### Administrative information

Ms Almudena Vazquez  
[biologie-etudiants@unil.ch](mailto:biologie-etudiants@unil.ch)

### Head of studies

Prof. Christian Fankhauser  
[Christian.Fankhauser@unil.ch](mailto:Christian.Fankhauser@unil.ch)

### Final enrolment date

30 April

Candidates needing a study visa must apply two months prior to this deadline.

### Start of courses

mid-September

### Part-time Master's degree

See Directive 3.12:

[www.unil.ch/interne/page44629.html#3](http://www.unil.ch/interne/page44629.html#3)

### Academic calendar

[www.unil.ch/central/page4804.html](http://www.unil.ch/central/page4804.html)

### General information on studies, career prospects and guidance

Guidance and advisory service:

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

### Accommodation and financial assistance

Office for socio-cultural affairs:

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

### International students

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

### Study abroad possibilities

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

