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## Master of science (MSc) in Biogeosciences

### GENERAL OUTLINE

#### Objectives

The Master of Science (MSc) in Biogeosciences is the result of the integration of two fields of natural sciences: biology and geology. It reflects the emergence of new fields of research in the many areas of contact between these two disciplines.

The objective of this Master's degree is to train you in the field of integrated natural sciences or Biogeosciences. It aims, through training based on the most modern techniques, to provide the essential knowledge and tools necessary for the discovery, understanding and management of natural environments in perpetual evolution on scales that are variable in time and space.

#### Skills development and career prospects

This Master's degree will teach you to understand and measure the interactions between the geosphere and the biosphere. It will prepare you to take an interdisciplinary approach, with courses in chemistry, ecology, biology, geology and pedology. The soil and its constituents, where many of these interactions take place, is central to your course as both the link between and

product of the geosphere and biosphere.

As an academic course, this Master's degree will teach you how to set up your own project, select the most appropriate methods, compare your observations with the scientific literature and develop a critical mindset. The presentations and reports you will be asked to produce will train you to communicate clear and understandable information orally, in writing or in the form of diagrams or maps. All of these skills will prepare you for a wide range of professions in a variety of working environments, such as:

- Federal and cantonal administrations
- Non governmental organisations
- Consulting firms
- Conservation and management of nature
- Conservation and management of soils
- Academic careers

Former students occupy a wide variety of roles, such as cantonal pedologist, scientist, scientific communicator, secondary school teacher and ecological consultant.

Alumni testimonials and positions:  
[www.unil.ch/perspectives/geosciences](http://www.unil.ch/perspectives/geosciences)

# The earth's crust: evolution shared by living beings and the mineral world

### GENERAL INFORMATION

#### Organisers

Faculty of Geosciences and Environment of the University of Lausanne  
Faculty of Science of the University of Neuchâtel

#### Degree awarded

Master of Science (MSc)  
in Biogeosciences

#### ECTS credits

120

#### Duration

4 semesters

#### Teaching language

French, some courses in English. Recommended level: C1.

#### Contact

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#### More information

[www.biogeosciences.ch](http://www.biogeosciences.ch)

Version: April 2021  
Subject to changes  
Only the official texts should be considered binding.

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



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Faculté des géosciences  
et de l'environnement

## EDUCATIONAL CONTENT

### Description

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The teaching activity is divided into ex-cathedra courses, practical work, field internships and personal research work. The degree course is organised in six course blocks (semester 1 and 2) and two research blocks (semester 3 and 4).

- **Module 1** teaches basic knowledge.
- **Module 2** teaches laboratory skills, field skills, spatial modelling and quantitative analytics.
- **Modules 3 and 4** provide the main training in Biogeosciences: elementary cycles on a global scale, biogeochemical exchanges at an ecosystem scale, stable isotopes, global soil diversity, microbiology and soil fauna, and the evolution of organic matter.
- **Module 5** is devoted to free-choice courses.
- **Module 6** offers a choice of one of two specialised teaching options: "Interactions Between Soil and Vegetation" or "Interactions in the Geobiosphere".

### Mobility

Subject to the prior agreement of the mobility Commission, you may study for one or two semesters in an institution recognised by UNIL or UNINE while continuing to be registered with the University of Lausanne.

## SYLLABUS

### Module 1 "Basic knowledge"

- Geology, floristics or microbiology, following the initial course
- Scientific methods

**6 ECTS credits**

### Module 2 "Analytical and technical methods"

- Soil description and pedological analyses
- Molecular ecology
- Geochemistry
- Spatial modelling of species
- Quantitative analyses

**12 ECTS credits**

### Module 3 "Biogeochemical cycles"

- Organic geochemistry and major cycles
- Environmental biogeochemistry
- Stable isotopes

**12 ECTS credits**

### Module 4 "Life and the soil"

- Soils around the world
- Microbiology (bacteria and fungi)
- Micro- and macrofauna in the soil
- Types of humus and ecosystem engineers

**12 ECTS credits**

### Module 5 "Free-choice courses"

- Various free-choice courses, some of which are delivered online
- Work placement, e.g. in a company

**6 ECTS credits**

### Module 6 – choice of specialisation "Interactions between Soil and Vegetation"

- Methods of studying vegetation
- Phytosociology
- Plant anatomy and ecology
- Field trips
- Landscape analysis and cartography

### or "Interactions in the Geobiosphere"

- Geomicrobiology
- Surface formations
- Paleoecology
- Rock-Eval method
- Landscape analysis and cartography

**12 ECTS credits**

### Module 7 and 8 "Research project and dissertation"

- Master's dissertation preparatory work (literature, objectives, methods, etc.)
- Data collection, analyses and writing the dissertation

**60 ECTS credits**

## PRACTICAL INFORMATION

### Admission requirements

Candidates must be holders of a Bachelor of Science in Geosciences and Environment, subject area Geology, awarded by the University of Lausanne or of a Bachelor of Science in Biology. Another degree or academic title may be judged equivalent and give access to the master's degree course, with or without further conditions.

### Enrolment and final date

Applications to be submitted before 30 April to the Admissions Office:  
[www.unil.ch/immat](http://www.unil.ch/immat)

Candidates needing a visa to study in Switzerland: 28 February (this particular deadline is only valid for enrolment at UNIL).

### 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, a Master programme can be followed part-time. See [www.unil.ch/formations/master-temps-partiel](http://www.unil.ch/formations/master-temps-partiel).

### General information on studies, guidance:

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

### Career prospects

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

### Accommodation and financial assistance

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

### International

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

