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Master of science (MSc) in earth sciences

GENERAL OUTLINE

Objectives

The Master of Science in Earth Sciences offers a multidisciplinary curriculum combining fundamental sciences and practical applications, which will give you the tools you need to become a versatile key player in the transition to a sustainable future. Our highly varied programme provides cutting-edge knowledge in a wide range of topics from the deep Earth, geobiosphere, and climatology, to geological risks, geoenergies, and mineral resources. Flexibility in choosing courses and internships allows you to adapt the curriculum to your interests.

The interactive teaching combines lectures, practical work and numerous excursions to natural sites in the Alps and abroad. It is delivered by specialists in Earth and environmental sciences from the universities of Lausanne and Geneva, who are at the forefront of development in their research fields, ensuring a modern approach to Earth sciences. The new programme, which has been fundamentally reworked, comes into effect in the autumn semester of 2022.

Career prospects

Master's studies in Earth Sciences provide the opportunity to acquire a wide range of interdisciplinary skills, including oral and written communication, critical thinking, the ability to analyse and summarise, carrying out a piece of original research, and adopting a comprehensive approach integrating observations and measurement in the field with laboratory or modeling data. Skills, combined with specialist knowledge, equip our students to pursue high-level careers after their studies in numerous sectors, including:

- Research and teaching (PhD thesis followed by an academic career in Switzerland or abroad)
- Applied geology companies
- Environmental assessments
- Assessment and management of natural resources
- Geoenergies
- Materials and geomaterials industry
- Geological risks and insurance
- Cantonal and federal administration
- Environmental and social NGOs

Examples of alumni roles and testimonials:
www.unil.ch/perspectives/geosciences

Is nature
still hiding
some of its
secrets?

GENERAL INFORMATION

Organiser

École lémanique des sciences de la Terre:
www.geoleman.ch
(UNIGE-UNIL)

Degree awarded

Master of Science (MSc) in Earth Sciences

ECTS credits

120

Duration

4 semesters

Teaching language

English. Recommended level: C1.

Contact

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Additional information

www.geoleman.ch



EDUCATIONAL CONTENT

Description

The **compulsory part** of the curriculum (20 ECTS) is made up of three modules. The first comprises refresher courses and three days in the field. The second is designed so that students learn to apply geosciences concepts in response to the major scientific and societal challenges in Earth Sciences, such as the origin of life or the energy transition. The third module focuses on analytical and quantitative methods (laboratory and modelling) used to study geological processes at different spatial and temporal scales.

The **constrained-choice part** (40 ECTS) comprises four modules, each worth 20 ECTS. Students choose one full module of courses (20 ECTS) and select individual courses from the other three modules for another 20 ECTS, giving a total of 40 ECTS. The first module, **“Geobiosphere, Climate and the Sedimentary Rock Records”** offers a multidisciplinary perspective on the interactions between the climate, life and sedimentary geology over geological time and in the modern world, by exploring fundamental concepts and their application to global changes and the energy transition. The second module, **“Dynamic Earth”** focuses on the quantification of natural processes, such as earthquakes, volcanic eruptions or the formation of mountain chains. The third module, **“Geohazards and Risks”** aims at understanding and managing geological risks, in particular those caused by volcanic eruptions, slope instability and earthquakes, by combining field data, numerical modelling and laboratory experiments. The fourth module, **“Earth Resources”** aims to provide the fundamental and applied geological skills necessary for the exploration and exploitation of resources that are essential to a successful energy transition and the development of a sustainable human economy.

The **free-choice part** (10 ECTS) allows students to tailor their curriculum with complementary options such as an internship in a company or additional courses selected from this Master's programme or others, in Switzerland or elsewhere.

Finally, the **research project** (5 + 45 ECTS), which will become the subject of the Master's dissertation, provides an opportunity for independent work by developing specific skills in an area of interest, with unique access to cutting-edge analytical laboratories. You will receive personalised support from one or more supervisors, ultimately allowing you to complete a project with high added value for research and your own career development.

SYLLABUS

Teaching for this programme is delivered at both UNIGE and UNIL. Train fares for travel between the two universities are reimbursed.

1st–2nd semesters

Compulsory courses

20 ECTS credits

- Module Kickstarter fortnight **3 ECTS**
- Module Great challenges in Earth and environmental sciences **7 ECTS**
- Module Quantitative and analytical methods **10 ECTS**

Constrained-choice

40 ECTS credits

- Module Geobiosphere, Climate and the Sedimentary Rock Records **20 ECTS**
- Module Dynamic Earth **20 ECTS**
- Module Geohazards and Risks **20 ECTS**
- Module Earth Resources **20 ECTS**

Free-choice options

10 ECTS credits

Master's Project

5 ECTS credits

3rd-4th semesters

Further free-choice options

Master's dissertation: original research project (i.e. field and/or laboratory work, analyses, interpretation and writing up the thesis).

45 ECTS credits

PRACTICAL INFORMATION

Admission requirements

The Bachelor of Science in Geosciences and Environment, subject area Geology, awarded by the University of Lausanne, or the Bachelor of Science in Earth Sciences awarded by the University of Geneva, provide direct, unconditional admission.

Another degree or academic title may be judged equivalent and give access to the Master's degree course, with or without further condition.

Enrolment and final date

Applications to be submitted before 30 April of each year to the Admissions Office of the University of Lausanne: www.unil.ch/immat

Candidates needing a visa to study in Switzerland: you must apply by 28 February preceding the autumn semester.

Start of courses

Mid-September

Academic calendar: 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.

General information on studies, guidance

www.unil.ch/soc

Career prospects

www.unil.ch/perspectives

Accommodation and financial assistance

www.unil.ch/sasme

International

www.unil.ch/international



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Faculté des géosciences
et de l'environnement