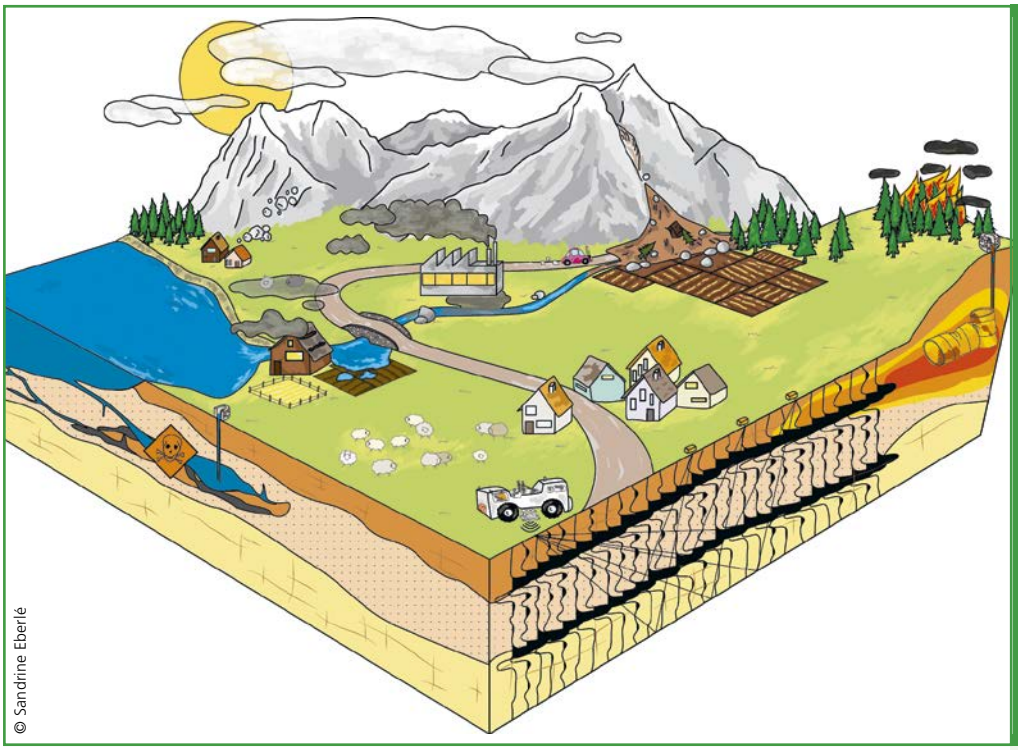

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can the earth do without experts ?

master of science (msc) in environmental science

GENERAL OUTLINE

Objectives

Human activities are a regular cause of imbalances in natural systems and the societies that depend upon them, at the local, regional, and global scales. Understanding the underlying physical, chemical and biological processes is essential for resolving contemporary environmental problems. This understanding is represented in the form of models that allow informed management decisions to be made. However, such models must take into account data gathered through observation and monitoring of the phenomena concerned. Otherwise, the information they provide will be of little real value.

The Master of Science in Environmental Science provides not only an adequate scientific grounding, but also an understanding of the fundamental links between the observation, modelling and monitoring of environmental phenomena, as each of these aspects enhances the credibility and quality of the other two. This combination also provides a deeper understanding of the phenomena themselves. The teaching programme focuses on areas of study affected by both physical and chemical processes (for example, water tables, landslides, landfills, diffuse or concentrated pollution), as well as the interactions between environmental disruptors and living organisms. Through this interdisciplinary approach, future professionals are trained to acquire the capacity to confront the increasingly complex interactions between the critical zone, ecosystems and human activities.

Career prospects

- Branches of the public administration responsible for environmental policy
- Non-governmental organisations dedicated to environmental protection
- Environmental management in companies
- Research institutes
- Consulting firms

Alumni move into a wide variety of roles, for example: PhD at ETH Zurich or director of a solar energy company. Others work at the Swiss Federal Office of Topography, for an energy, water and telecommunications supply company or in teaching.

Example of opportunities and alumni's profiles:
www.unil.ch/perspectives/geosciences

GENERAL INFORMATION

Organisers

Faculty of Geosciences and Environment
School of Geosciences and Environment
www.unil.ch/gse

Degree awarded

Master of Science (MSc) in Environmental Science

ECTS credits

120

Duration

4 semesters

Teaching language

All compulsory courses are given in English. Students have to choose optional courses, and these may be given in English or French according to their choice. The recommended level of English is C1. All assessed work, including exams, reports and the Master's dissertation may be written in English or French.

Contact

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Additional information

www.unil.ch/masterenvi

Version: February 2019
Subject to changes.
Only the official texts are authentic.

www.unil.ch/masters

UNIL | Université de Lausanne
Faculté des géosciences et de l'environnement

EDUCATIONAL CONTENT

Description
The Master's programme is organised into four parts. In the first year, students take compulsory courses from two core modules and their chosen specialisation module:

Part 1: Core modules
- Foundations in Environmental science
- Environmental Data and Systems Analysis

Part 2: Specialisation module
- Aquatic Science **or**
- Natural Hazards and Risk

In the second year, students complete free-choice courses along with their Master's thesis.

Part 3: Free-choice course module

Part 4: Master's thesis

Examinations
Evaluations may take the form of written or oral examinations, practical work, discussions, or field trip reports.

Mobility
Subject to the prior agreement of the Mobility Committee, students may study during their third semester at a recognised institution while continuing to be registered at the University of Lausanne.

Skills development
The aim of the syllabus is to train students to describe, understand and model physical and/or chemical processes of both natural and anthropogenic origin. To this end, students will learn how to use quantitative methodologies in environmental science (field measurements, laboratory work and data analysis), as well as how to choose appropriate techniques for the evaluation and monitoring of environmental problems. They will have to address the issues related to a theme on the theoretical and empirical foundations of natural science, while taking into account the complexity, uncertainties, and limits of knowledge concerning environmental processes.

University studies develop a great many transverse skills such as: oral and written communication; critical, analytical and summarising faculties; abilities in research, etc. This panoply of skills, combined with specialist knowledge acquired over the course of studies, is excellent preparation for a wide range of employment opportunities such as those mentioned under "Career prospects".

SYLLABUS

Core Module "Foundations in Environmental Science"
- Applications of Environmental Science Seminar Series
- Research Methods and Project Design
- Introduction to Environmental Systems Analysis

10 ECTS credits

Core Module "Environmental Data and Systems Analysis"
Choose 4 courses from the 6 listed below:
- Model Parameter Estimation and Uncertainty Quantification
- Environmental Time-Series Analysis
- Remote Sensing of Earth Systems
- Environmental Data Mining
- Geostatistics and GIS
- Scientific Computing

20 ECTS credits

Specialisation "Aquatic Science"
- Fluid Flow and Transport in the Subsurface
- Environmental Biogeochemistry: Molecular-Scale Perspectives on Water-Microbe-Mineral Interactions
- Environmental Chemistry and Toxicology
- Aquatic Ecosystems: Glaciers, Rivers, and Lakes
- Tracing Biogeochemical Processes and Fluxes Using Isotope Analysis
- Field and Laboratory Methods
  (I) The UNIL Campus as a Microcosm
  (II) Alpine Catchments

30 ECTS credits

Specialisation "Natural Hazards and Risk"
- Communication on Environmental Risks
- Advanced Quantitative Risk & Vulnerability
- Risk Quantification and Insurance
- Risk Management (Monitoring, Early Warning, Post-Disaster Preparedness)
- Erosion and Slope Movements
- Monitoring Techniques for Slope Dynamics
- Hazards and Risks of Slope Mass Movements: Field Camp
- Flood Risk Modeling

30 ECTS credits

Free Choice Module
20 ECTS credits

Master's Thesis
40 ECTS credits

PRACTICAL INFORMATION

Admission requirements
The criteria for admission into the Master's programme are either
- a Bachelor of Science in Geosciences and Environment, subject area Environmental Sciences or Geology, awarded by the University of Lausanne
- another degree or academic title judged to be sufficient to gain access to the programme, with or without further conditions

Enrolment and final date
The candidate's application must be submitted to the Admissions Department before 30th April: www.unil.ch/immat

Candidates needing a visa to study in Switzerland: 28 February.

Start of courses
Mid-September
Academic calendar: www.unil.ch/central/calendar

Part-time Master's degree
Under certain conditions, a Master's programme can be followed part-time. See www.unil.ch/formations/tempspartiel.

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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