MASTER

MSc in Environmental Sciences

Major in Ecology and Evolution

Departement Umweltwissenschaften
Department of Environmental Sciences

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Master in Environmental Sciences

Why Environmental Sciences → The Master course in Environmental Sciences provides a high level and research-based education of how the natural environment works and how humans interact with both the biotic and abiotic environment. We attract students who are keen on expanding their knowledge in one of our major's subjects. In their professional life graduates of Environmental Sciences are active as experts and leaders in diverse settings – universities, research institutions, environmental and planning offices, public services, and also in relevant sections of the banking, insurance and industrial services.

Course structure → The two-year Master course is composed of four modules amounting to a total of 120 credit points (CP).

2 semesters		1 semester	1 semester
Major 40 CP	**Minors** 20 CP	**Work experience** 30 CP	**Master thesis** 30 CP

Major in Atmosphere and Climate

Major in Biogeochemistry and Pollutant Dynamics

Major in Ecology and Evolution

Major in Human-Environment Systems

Major in Forest and Landscape Management

Major in Human Health, Nutrition and Environment

Major in Ecology and Evolution → The major in Ecology and Evolution covers modern research on biodiversity, evolutionary processes, interactions between organisms and their environment, the functioning of populations, communities and ecosystems, their responses to human management, and issues of nature conservation. Students acquire an in-depth understanding of ecological and evolutionary principles, skills in field and laboratory research, and the ability to tackle practical problems using ecological knowledge.

→ **www.ibz.ethz.ch**

A challenging, diverse and modern programme on ecological and evolutionary principles and their practical application

«Ecology and evolution are disciplines of the greatest relevance for modern society. Our masters programme is intended not only for students interested in a scientific career, but also for others who wish to deepen their understanding of these important subjects.» P. J. Edwards, Professor of Plant Ecology.

«In this programme, we cover the full breadth of ecology and evolution from the conceptual foundation to current applications.» S. Bonhoeffer, Professor of Theoretical Biology

«My studies in environmental sciences and a PhD in plant ecology have provided a basis for a fulfilling job. As an ecological consultant, I have contributed to the development of landscape concepts, the ecological restoration of road works, the conservation of rare plant species and the monitoring of biodiversity.» U. Bollens, Ecologist

Front picture: Field experiments help us to understand the functioning of natural ecosystems. Here, plant communities were established in experimental plots to investigate competitive interactions and the development of wetland vegetation. Some of the results are now being applied in a large-scale wetland restoration project.

Picture: Beat Ernst, Basle

By combining modern molecular techniques with detailed studies of natural populations, we learn how biological diversity evolves, and how organisms adapt to their environment.

Aims of studies in Ecology and Evolution

Our motivation → As ecologists and evolutionary biologists, we are fascinated by the diversity of organisms, communities and ecosystems which occur in our world. We wish to know about the patterns and significance of biological diversity and how it evolves, so that we can contribute to its preservation. We are interested in the adaptations of organisms and in the dynamics of populations in order to predict how they will respond to changes in environmental conditions or management. We study the multiple interactions among the components of ecological communities and the processes which determine the functioning of ecosystems. We are concerned by the loss of natural habitats and develop techniques for their restoration and conservation. We look forward to share our interests with the students taking our courses.

Our students → You will enjoy studying Ecology and Evolution if you are interested in the biology of plants and animals, curious to understand ecological and evolutionary processes, challenged by a broad range of topics and approaches, enthusiastic about working in the field and/or laboratory, and motivated to tackle ecological questions by relating theoretical concepts to your observations and experimental results.

Our ecological knowledge enables us to maintain or recreate suitable habitats for endangered plant and animal species.

Course topics

The core courses of the major in Ecology and Evolution are grouped into three thematic modules, from which you have to obtain 40 credit points (CP). In addition, you can take one or two minors or select courses from among a wide choice of optional courses according to your personal interests and professional ambitions.

Our offer	Your choice: 60 CP	
Core courses: three modules, 40 credit points		
A. Principles	≥ 12 CP	In total 40 CP from the core courses
B. Applications	≥ 12 CP	
C. Term paper and seminar (mandatory)	8 CP	
Elective courses		
• Minors • List of recommended courses from other Master programmes	20 CP from the elective courses or other master-level courses	

Principles → functional plant ecology, ecology and evolution: genetics, phylogeny and systematics, topics in ecosystem ecology, modelling and laboratory courses in population and evolutionary biology, groundwater and wetland ecology, etc.

Applications → conservation genetics, wildlife conservation and management, environmental governance, ecological assessment and evaluation, foundations of ecosystem management, vegetation ecology lab, etc.

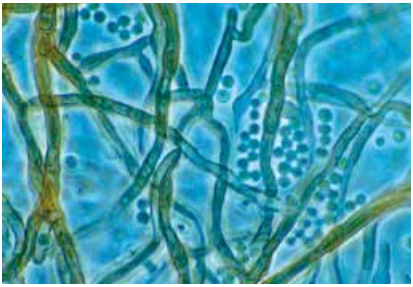
Elective courses → ecology and evolution: populations, field course in evolutionary biology, mountain forest ecology, advanced landscape ecology, integrative plant sciences, research seminar in ecological genetics, global change biology, biogeography, biodiversity and ecosystem goods and services, mycological field course, etc.

Course structure

Lectures and seminars mainly take place in the first part of the week, whereas the second part of the week is largely devoted to practical courses and independent work. Several field courses are offered as one-week blocks during the summer.

Gaining research experience is an important aim of the programme. During field and laboratory courses, you will design your own research projects, develop hypotheses, collect and analyse data, present your findings, and discuss them with your colleagues.

Master thesis → The Master programme is completed with a half-year research project, during which you will either join a research group of the Department or work outside ETH together with practitioners.



«For my Master thesis in forest pathology I worked on the population biology of root fungi and became fascinated by these organisms. Now I am aiming at a Ph.D. in fungal evolutionary ecology.»

«We investigated plant invasion processes along the Italian river Tagliamento. We did ten weeks of field work in this extraordinary landscape. The collaboration with international research teams and local people was an enriching experience.»

Who can apply
→ www.env.ethz.ch/education/master

The Master programme in Environmental Sciences at ETH Zurich is based on the corresponding Bachelor in Environmental Sciences ETH. Graduates of ETH or graduates of universities in Switzerland and from abroad are welcome.

How to apply
→ www.rektorat.ethz.ch/students/admission/master

The Admissions Office of ETH Zurich informs and advises prospective students (graduates of universities in Switzerland other than ETH and from abroad) concerning the admission procedure and the enrolment requirements.

When to apply
→ www.rektorat.ethz.ch/calendar/students

The application period for admission to the Master course and the academic calendar are published online.

Interested?
→ www.env.ethz.ch/prospective_students/master/uwis

Use our online evaluation tool to assess your qualification for the Master programme in Environmental Sciences and to choose a suitable major.

Information
→ www.env.ethz.ch

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