Curriculum

The Universities of Bern and Fribourg offer an MSc degree in Earth Sciences. One of the following five special qualifications within this programme may be chosen:

- Earth and Life Evolution
- Earth Materials
- Environmental & Resource Geochemistry
- Geology
- Pure and Applied Quaternary Science

All MSc candidates complete a course module entitled Dynamic Alps, which serves as a common basis for all the specialties. Each speciality consists of a set of mandatory courses, a set of elective courses and a thesis project. Thesis work is spread over all 4 semesters of the degree programme and the topic of the thesis lies within the chosen specialty.

Special qualifications

**Earth and Life Evolution**
The evolution of the geosphere and that of the biosphere – linked by a common theme: the processes and the unique history that have produced our life-sustaining planet.

**Earth Materials:**
Selected topics in mineralogy and petrology, both pure and applied aspects, e.g. properties and uses of clay minerals, zeolites in nature and industry, stability of minerals.

**Environmental & Resource Geochemistry:**
Processes of rock–water interaction relevant to groundwater quality, remediation of contaminated sites, deep geological disposal of radioactive and toxic wastes, genesis and exploration of mineral resources, and development of secondary resources.

**Geology:**
Structures and deformation of the lithosphere and of rocks, including the metamorphic and tectonic development of orogens, interaction between Earth internal and surface processes.

**Pure and Applied Quaternary Science**
Surface processes in orogens and in their forelands, glaciology, paleoclimate research, dating, humans as geological agents, engineering geology.

Weighting of modules

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<th>Modul A</th>
<th>Modul B</th>
<th>Modul C</th>
<th>Modul D</th>
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<tbody>
<tr>
<td>Mandatory Courses</td>
<td>Specialty Courses</td>
<td>Elective Courses</td>
<td>Research Thesis</td>
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<td>1st semester</td>
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<td>6 EC</td>
<td>30 EC</td>
<td>24 EC</td>
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Eligibility and Fees

Students with a university-level BSc in Earth Sciences are eligible for the MSc degree. Students with a BSc in a related field (e.g. physical geography, physics, chemistry, biology) may also be eligible, depending on the specific curriculum covered in their BSc coursework.

Fees (for the entire MSc course)
- Bern: CHF 3236.-
- Fribourg: CHF 2620.- for Swiss students
- 3220.- for foreign students

BeFri is the acronym for the cooperative research and teaching network between the Universities of Bern and Fribourg. All lectures given in English.
A broad perspective

Sediments from the Quaternary Period (i.e. the last 2.6 Mio years) are valuable archives to
• reconstruct environmental and climate change
• identify recurrence rates and intensities of various natural hazards
• to quantify human impact

Knowledge of past environments and climates are critical for evaluating ongoing processes as well as for modeling future changes. Quaternary sediments (gravel, sand, till, loess, lake and marine deposits) are usually much more easily remobilized than hard rocks and represent a high potential for geohazards such as mass movements and debris flows. Many challenges regarding environmental geology, geotechnology and hazard assessments are linked to unconsolidated Quaternary sediments. They also host important resources for society.

MSc-Curriculum

- Field courses on land and on lakes to identify and recover Quaternary sediments for environmental reconstructions
- Geological and geophysical field surveying
- Laboratory and field analytics in geotechnical engineering
- Training in Quaternary dating methods
- Drill-core analyses and interpretation
- Analysis of natural hazards and risks
- Investigating human-environment interaction

Professional training

The Master in Pure and Applied Quaternary Sciences represents an integrated approach for training students in all aspects concerning Quaternary sediments including sedimentology, geochemistry, geomorphology and geochronology. The courses comprise various geophysical and geological field survey techniques, laboratory analyses and software applications. The covered case studies will allow to quantify climate/environmental change, natural hazards and human impact. This approach guarantees a fundamental education that will enable graduates to face everyday geologic challenges both scientifically and applied. This Master training - including geotechnical engineering in collaboration with the Geocenter Burgdorf - reflects the true interdisciplinary nature of this segment of Earth Sciences.