Earth Sciences

Degree conferred
Master of Science in Earth Sciences
Universities of Fribourg and Berne

Options
Five options available:

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

Languages of study
Study in English

Commencement of studies
Commencement of studies in the Autumn Semester (September) or in the Spring Semester (February)

Access to further studies
Ph.D.

This master programme in Earth Sciences consists of a joint programme run by the Department of Geosciences at the University of Fribourg and the Institute of Geological Sciences at the University of Bern. Students profit from the expanded number of lecturers and researchers, and from the specialised geological know-how and facilities at both institutions. Taught in English, it includes a choice from five options: 1. Earth and Life Evolution (an exploration of the evolution of the geosphere and the biosphere); 2. Earth Materials (a multidisciplinary approach to geology and material sciences); 3. Environmental and Resource Geochemistry (the chemical and physical interaction between aqueous fluids and the solid substrate); 4. Geology (the understanding of geological processes and the results thereof in space and time, ranging from unconsolidated soil to solid rock on both small and large scales); 5. Pure and Applied Quaternary Sciences (an integrated approach to quaternary sediments).

Profile of the study programme

Have your bachelor's studies infected you with a fascination for Geology? Do you wish to train for an exciting career in research or industry? The Master of Science in Earth Sciences (BEFRI) is a joint programme run by the Department of Geosciences at the University of Fribourg and the Institute of Geological Sciences at the University of Bern within the framework of the inter-university «BEFRI» Convention. With only a twenty minute train trip separating the two universities, students profit from the expanded number of lecturers and researchers, and from the specialised geological know-how and facilities at both institutions. The merger of capabilities allows an exciting and varied curriculum to be offered in a two-year degree taught in English.

Highlights of the master include a choice from five options:

1. **Earth and Life Evolution**
   This option explores two complementary aspects of earth sciences – 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. It is a curriculum dominated by curiosity-driven pure science, based on the subdisciplines of paleontology, sedimentology, and geochemistry. The breadth of the training acquired in this option leads to a wide choice of professional opportunities in academia at universities, research institutions, museums, space agencies, as well as in applied earth sciences such as hydrocarbon exploration and resource management.
2. **Earth Materials**
   Main aspect of this option is multidisciplinary between geology and material sciences. The intention of this option aims to provide skills for investigating and characterising minerals, rocks, and crystalline solids in general, with special emphasis on their properties. This also includes developing models on formation and stability of rocks and minerals, synthesis of corresponding materials under laboratory conditions, and testing possible applications in technology and ecology. In the past, graduates specialised in this field accepted positions in industry and research institutes dealing with refractories, glass, cement, gem stones, or other crystalline solids of technological importance.
3. **Environmental and Resource Geochemistry**
   This option has become a large sector of professional activity for Earth Science graduates. The reason for this development is that virtually any exploitation of geological resources or disposal of solid waste impacts the environment. From a scientific point of view, the impact is mainly due to the chemical and physical interaction between aqueous fluids and the solid substrate (rock, solid waste etc.). The curriculum spans this realm of «water-rock» interaction, in order to prepare students to tackle the huge variety of problems that are encountered in professional practice. Experts are particularly sought in fields such as exploration of mineral and energy resources, geochemical assessment and protection of groundwater reserves, geological disposal of toxic or radioactive wastes, clean-up of contaminated sites, development of geothermal energy and underground storage of anthropogenic CO_2.
4. **Geology**
   The option spans the entire realm from unconsolidated soil to solid rock, on both small and large scales with a common theme: the understanding of geological processes and the results thereof in space and time. Due to this breadth, natural overlapping with the other four options is inevitable. A careful selection of courses can provide a widely based

education, with certain areas of increased expertise, thus preparing the students to tackle the huge variety of problems that are encountered in professional practice. Industry and government agencies throughout the world have a considerable demand for scientific experts in sectors such as resource supply, disposal of waste, geotechnical aspects of construction projects or mining operations, or as assessing risk and ecological compatibility.

5. **Pure and Applied Quaternary Sciences**
   This option represents an integrated approach for training students in all aspects of quaternary sediments, which cover most of the Earth surface. The heavily populated areas in the world are found in geological environments dominated by such unconsolidated rocks. As a consequence, most challenges regarding geohazards such as mass movements and mud flows, environmental geology and geotechnology are linked to such sediments. Courses in sedimentology, anthropogenic impacts on earth surface processes, dating of sedimentary sequences, glaciology and geomorphology, as well as physical properties of unconsolidated rocks guarantees a fundamental education that will enable graduates to face everyday challenges regarding unconsolidated sediments. Experts in this field are engaged by companies and public agencies working in the field of engineering geology, hydrogeology or natural hazards.

Studies organisation

Structure of studies

120 ECTS credits, 4 semesters

Curriculum

http://studies.unifr.ch/go/vBvMa

Admission

Master's degree programmes are built on the knowledge and abilities that were acquired when obtaining a bachelor's degree.

Holders of a bachelor's degree awarded by a Swiss university are admitted to a master's degree programme without any preconditions if they have earned 60 or 90 ECTS credits – depending on the chosen master's degree programme – within the corresponding discipline. However, additional requirements can be required. The same applies to holders of a bachelor's degree awarded by a foreign university, provided that the bachelor's degree is recognised and considered equivalent by the University of Fribourg.

Holders of a bachelor's degree awarded by a Swiss or a foreign university, provided that the bachelor's degree is recognised and considered equivalent by the University of Fribourg, who do not fulfil this condition can be admitted to a master's degree programme with preconditions (which must be successfully completed before starting the master's degree programme) and/or additional requirements (which can be completed during the master's degree programme). The preconditions and/or additional requirements may not exceed 60 ECTS credits in total. The same applies to holders of a bachelor's degree awarded by a Swiss university of applied sciences, according to existing agreements.

The respective conditions of admission for each master's degree programme are reserved.

Contact

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