Biology

Degree conferred
Bachelor of Science in Biology

Options
This study programme offers various orientations to choose from.

Languages of study
Study in French and German

Commencement of studies
Commencement of studies only in the Autumn Semester (September)

Access to further studies
This bachelor programme qualifies students for the master programmes **Environmental Biology** et **Molecular Life and Health Sciences**

The study of biology imparts knowledge of the fundamental processes on which life – from the simplest bacteria to the human being – is based. This includes development and behaviour of organisms, as well as their interaction with the environment. During the first academic year, students acquire the necessary basic knowledge (general biology, organism biology, biochemistry, chemistry, mathematics, physics). During the second and third years, students explore more specialised topics giving them a general knowlegde of the main themes in modern biology. In addition to lectures, the study programme contains exercises, practical training and seminars, as well as writing a bachelor's thesis in a research unit.

Profile of the study programme

The study programme in biology opens the door to a fascinating world. It imparts knowledge of the basic processes underlying the life of the simplest bacterial cell to the human being. Biology deals with the smallest molecular structures, such as genetic material or proteins, as well as with the architecture of entire cells and tissues that contribute to the development of complex organisms. In addition to the analysis of the structure, function and interaction of macromolecules, such as molecular networks and cellular interactions, the development and behaviour of organisms and their interactions with the environment are also studied. Biological research provides the foundations for genetics, molecular biology, cell biology, microbiology, biotechnology, evolutionary biology and environmental sciences. In the medical area, biological research imparts essential knowledge about the structure and functioning of the human body, based on which medicine can determine the causes and effects of illnesses and develop suitable therapies. With the help of biological knowledge, pharmaceutics can in turn produce indispensable drugs, such as insulin or antibiotics, from genetically altered microorganisms instead of from their natural biological source. The production of such drugs is more economical and much more effective. When it comes to farming, crops are equipped with resistance factors against pests and are made less sensitive to drought or a lack of nutrients. In addition, optimal conditions can be determined for the sustainable use of natural resources.

Fribourg profile
The first academic year is the same for all students and constitutes the scientific foundation for the higher semesters. It imparts the necessary and indispensable scientific basic knowledge for the study of biology, the so-called propaedeutic subjects (general biology, organism biology, biochemistry, chemistry, mathematics and physics). The bachelor programme consists of the major subject, plus one or two selectable additional minors. The major includes the propaedeutic subjects as well as many lectures, exercises, practical courses, seminars and a bachelor's thesis in a research unit.

Second and third year: environmental biology and organisms
Ecology consists of the study of living organism and their interplay with their biotic environment – the other living organisms – and the biologically dead environment. The understanding of this interrelationship is seen solely within the context of evolutionary theory.
These two aspects are thus closely linked to each other. The areas of ecology and evolution are encompassing and varied, ranging from the study of micro-organisms to the study of natural ecosystems, from the dynamics of populations to the understanding of the processes of species creation. Because of the global changes that are due to human activities, ecology has become a main issue in society. The protection of biological diversity, the study of biodiversity and the functioning of ecosystems are very active areas of research. Due to its diversity, the study of ecology and evolution calls for a solid basis in general and molecular biology, genetics, and knowledge of species, but also in chemistry, physics and especially mathematics and statistics. This orientation covers different areas, whereby theoretical lectures, laboratory courses, and field work are offered.

Second and third year: molecular topics
Other lectures are strongly focused on research projects within the field of zoology and plant biology conducted in molecular biology on animal and plant model systems (*C. elegans*, *Drosophila*, zebrafish, mouse, *Arabidopsis* and Petunia). In addition to the conventional strategies in molecular biology, biochemistry, genetics and cell biology, the spectrum of experimental methods also encompasses other modern techniques, such as fluorescence and confocal microscopy, «high throughput» DNA sequencing and analysis of results with bioinformatic methods, purification and analysis of protein complexes and mass spectroscopy, PCR and the production of transgenic microorganisms, plants or animals.

The courses of the bachelor in biology are held in German and/or in French, or on some occasions in English or bilingual French/German.

Professional openings

The biology studies at the University of Fribourg are thus suited for students who later wish to offer a broad range of skills on the job market in the areas of molecular and organismic biology.

Studies organisation

Structure of studies

120 ECTS credits + 60 ECTS credits in one or two minor study programmes freely chosen, 6 semesters

Curriculum

http://studies.unifr.ch/go/mjkY5 *(French)*
http://studies.unifr.ch/go/0fTFn *(German)*

Admission

The following **Swiss school-leaving certificates** grant **admission to bachelor programmes** at the University of Fribourg:

- Swiss academic Maturity Certificate
- Federal vocational or specialised Baccalaureate + supplementary examination of the Swiss Maturity Commission (passerelle)
- Bachelor Degree from a Swiss university, from an accredited Swiss university of applied sciences (HES/FH) or from a Swiss university of teacher education (HEP/PH)

A **complete list of all further recognised Swiss school-leaving certificates** is to be found on the webpages of swissuniversities (*in French and German only*): https://studies.unifr.ch/go/fr-admission-swisscertificates; https://studies.unifr.ch/go/de-admission-swisscertificates
Foreign upper secondary school-leaving certificates are recognised only if they correspond substantially to the Swiss Maturity Certificate. They must qualify as general education. Foreign school-leaving certificates are considered to be general education if, among other things, the last three years of schooling include at least six general education subjects, independent from each other, in accordance with the following list:

1. Language of instruction (at the school)
2. Second language (a foreign language)
3. Mathematics
4. Natural sciences (biology or chemistry or physics)
5. Humanities and social sciences (geography or history or economics/law)
6. Elective (computer sciences or philosophy or an additional language or an additional subject from category 4 or 5)

The general **admission** requirements to the **bachelor programmes** at the University of Fribourg for holders of foreign school-leaving certificates as well as the **admission requirements for individual countries** are to be found on the webpages of swissuniversities: https://studies.unifr.ch/go/en-admission-countries
In addition, applicants with foreign school-leaving certificates must present **proof of sufficient language skills in French or German**.
All guidelines are available at *(only in French and German)*: https://studies.unifr.ch/go/adm-guidelines

The assessment of foreign school-leaving certificates is based on the «Recommendations for the Assessment of Foreign Upper Secondary School-Leaving Certificates» adopted by the Chamber of universities of swissuniversities on 21.11.2024 (https://studies.unifr.ch/go/swissuniversities24fr; https://studies.unifr.ch/go/swissuniversities24de). The admission requirements are valid for the respective academic year. The Rectorat of the University of Fribourg reserves the right to change these requirements at any time.

Alternatives

Also offered as a minor study programme (60/30 ECTS credits).

Contact

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