Bioinformatics

Degree conferred
Scientiarum doctor in bioinformatica / Doctor of Philosophy in Bioinformatics (PhD)

Commencement of studies
An application for admission may be submitted at any time.

Regulation
https://studies.unifr.ch/go/1Q *(French and German only)*

Application procedure
Candidates with Swiss qualifications
https://studies.unifr.ch/go/Ui3b4
Candidates with foreign qualifications
https://studies.unifr.ch/go/2KPbe

Fribourg profile

Fascinated by **biological questions** and intrigued by the opportunities **Big Data** and **high computer power** offers to tackle them? Jump right into it with a PhD Bioinformatics!

Why study bioinformatics and computational biology?
It took 13 years and 3 billion dollars to decipher the human genome. Today, sequencing a whole genome takes but a few hours on a machine that fits on a tabletop at a tiny fraction of the original costs. Similar technological revolutions are underway in biological imaging, mass spectrometry based proteomics and metabolomics or ecological remote sensing, just to name a few. Consequently, **biological and medical sciences are now collecting enormous amounts of information**. This tsunami of data generates new problems: it needs to be analysed properly to unearth and retrieve the exciting knowledge it contains. And, most importantly, it also has to be made available to the scientific community in a useful way.

Scientists with skills in biology and in computer technology are challenged to extract the relevant information out of this phenomenal sea of data. **Information technologies are essential for a proper understanding** of the regulatory modalities of cells, organisms and even entire ecosystems. Developing algorithms and sound statistical tools to grasp the folding of macromolecules are the first steps on our way to model the mechanisms behind the pure DNA sequence. Ultimately, we want to understand how organisms that are as complex as a human being work.

Our PhD Programme in Bioinformatics
The University of Fribourg is proud to offer a PhD programme in Bioinformatics that will trim you fit to meet these huge **scientific challenges and opportunities**.

Bioinformatics and computational biology have direct and highly sought applications in basic and applied research ranging from conservation biology and modeling molecular networks to epidemiology, biomedical engineering and drug design, artistic data visualisation and developing human-computer interaction. Consequently, topics of PhDs in Bioinformatics at the University of Fribourg are rather diverse and include:

- Bacterial genomics (e.g. the identification of genes conferring drug resistance or constituting virulence factors)
- Gene interaction networks (e.g. characterising the transcriptional feedback loops that define circadian oscillators)
- Medical genetics (e.g. developing methods to increase the power of genome-wide association studies)
- Population genetics (e.g. harnessing the power of time-series data to study adaptive processes)
- Statistical genetics (e.g. developing a genotyping pipeline for ancient DNA)
- Proteomics and metabolomics (e.g. quantifying changes in protein abundance with age)
- Image analysis (e.g. automated species recognition for ecological surveys)
- Conservation biology (e.g. inferring the demographic history of an endangered species to device appropriate conservation measures)

Apart from detailed knowledge in the field, PhD students will also learn to conduct independent research projects, to interpret and present scientific data and to put their work into a general context. To an interdisciplinary research field such as bioinformatics and computational biology, the **exchange and interaction** with people from many different fields is of uttermost importance. We actively promote such exchanges and interactions by organising workshops and courses of various topics.

PhD students will further take part in the *Fribourg Graduate School of Life Sciences and Medicine (FGLM)* and the PhD Training Network of the Swiss Institute of Bioinformatics. Contacts established during the PhD thesis provide **valuable networking opportunities** that will widen your job prospects in academia as well as in the private sector. We thus also give all our PhD students the opportunity to present their work at international conferences and to meet people working on similar questions from close and far.

PhD students in the Department of Biology are remunerated according to standards of the Faculty of Science. Funding for PhD projects is available in multiple ways: 1) through project funds attributed to individual labs. Interested candidates are encouraged to select a laboratory in which they would like to carry out their PhD (see Contact) and contact the group leader directly to ask for a possible opening; 2) through openings posted by the *Fribourg Graduate School of Life Sciences and Medicine (FGLM)*. The selection procedure is carried out twice a year (see link below for details); 3) through funding acquired by the PhD candidate. Before applying for funds, candidates should contact the group leader under which supervision they would like to carry out their PhD.

Studies organisation

Structure of studies

ECTS credits can be earned.

Doctoral school

http://studies.unifr.ch/go/phd-fglm

Admission

In order to be admitted to a doctorate the candidate must have been awarded an academic **bachelor's and master's degree** or an equivalent qualification from a university recognised by the University of Fribourg.

Before applying for a doctorate the candidate must contact **a professor** who would be willing to supervise the thesis work.

There is **no general right** to be admitted to a doctorate.

The respective conditions of admission for each doctoral study programme are reserved.

Contact

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Doc- Postdoc-portal

http://www.unifr.ch/phd