Bioinformatics and Computational Biology

Degree conferred
Master of Science in Bioinformatics and computational Biology
Universities of Fribourg and Berne

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.

Fascinated by biological questions and intrigued by the
opportunities Big Data and high computer power offers to tackle
them? Jump right into it with our master programme in
Bioinformatics and Computational Biology!

Profile of the study programme

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,
biochemical and medical sciences are now collecting enormous
amounts of information with the goal to describe and understand
how cells, complex organisms or entire ecosystems function. But
this tsunami of data generates new challenges: How can we
unearth and retrieve the exciting knowledge hidden in such data?
How can we make such massive amounts of data available to the
scientific community? A proper analysis of this trove of this data
does not only require massive amounts calculation power, but also
talented people with knowledge in both biology as well as in
computer science and statistics to develop adequate and
computationally fast analysis tools.

The Master of Science in Bioinformatics and Computational Biology
is an interdisciplinary programme taught exclusively in English and
jointly organised between the Universities of Fribourg and Bern. All
involved departments offer outstanding conditions for research and
training and highly competitive researcher-student ratios.

The study programme of the first semester builds upon your
expertise in biology, biochemistry or life science, or respectively in
mathematics, computer science or physics and complements your
background with individually tailored courses in programming,
statistics or fundamental biology. In the second and third semester
you will then concentrate on the major topics in bioinformatics and
computational biology, namely in data management, the analysis of
sequence data, modeling of biological systems, image analysis,
systems biology and personalised health. The so acquired skills will
further be reinforced through intensive hands-on training and
practical courses. The fourth semester is then devoted to your own
research project that you will conduct in an internationally
recognised research lab at the University of Fribourg or Bern.
Alternatively, your project may also be conducted in collaboration
with an affiliated institute (e.g. the Swiss Institute of Bioinformatics),
a governmental institution or the private sector.

Learning objectives and career opportunities

Our master programme in Bioinformatics and Computational
Biology will trim you fit for a career in the life sciences, health
science or in food technology, both in industry or in governmental
or non-governmental organisations, as well as for a PhD in academia.
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. Our
programme further promotes the exchange and interaction with
people from many different fields, which will considerably widen
your job prospects in academia as well as in the private sector.

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. Bachelor degrees that are considered for admission without any preconditions to the MSc in Bioinformatics and computational Biology are:

– Biology
– Life Sciences
– Mathematics/Statistics
– Informatics/Bioinformatics
– Computational Sciences
– Physics

Contact

Faculty of Science and Medicine
Department of Biology
Sabrina Lutz, secretary
sabrina.lutz@unifr.ch
Prof. Daniel Wegmann, study advisor
daniel.wegmann@unifr.ch
http://studies.unifr.ch/go/en-biology