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 only in the Autumn Semester (September)

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, biological 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 Universites 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/Biochemistry
– Life Sciences
– Mathematics/Statistics
– Informatics/Bioinformatics
– Computational Sciences
– Physics
– Biomedical Sciences

Contact

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