

## The MSc in Bioinformatics & Computational Biology – University of Bern

### Information taken from:

[http://www.biology.unibe.ch/content/bioinformatics/msc\\_bioinformatics/curriculum/index\\_eng.html](http://www.biology.unibe.ch/content/bioinformatics/msc_bioinformatics/curriculum/index_eng.html)

Specifically designed courses bring you up to speed in Bioinformatics and Computational Biology. You will acquire the tools of the trade focusing on solving current biological problems.

There is no bachelor course as a precursor to this master program. [Admission](#) is granted to applicants coming from various fields of study.

To benefit the most of the courses and practical parts, you would want to bring your own laptop computer equipped with at least 4 GB of RAM and WiFi.

### The curriculum at a glance

The programme requires **60 ECTS credits from courses** normally taken over 2 semesters, followed by a 6 months MSc research project and a **written thesis (30 ECTS)**. Full time students can complete the programme in 3 semesters. Note that the program **starts in the fall semester**.

The first semester consists of courses specifically designed to complement your existing knowledge: an introduction to programming and Linux (7ECTS) for people with a background in biology or life sciences, and an introduction to the fundamentals of biology and lab work (7 ECTS) for those with a background in computer science, mathematics, statistics or a related field.

|                     |                       |                |
|---------------------|-----------------------|----------------|
| 3 <sup>rd</sup> Sem | Thesis                | 30 ECTS        |
| 2 <sup>nd</sup> Sem | Compulsory Courses    | 30 ECTS        |
| 1 <sup>st</sup> Sem | Compulsory Courses    | 16 ECTS        |
|                     | Elective Courses      | 7 ECTS         |
|                     | Programming and Linux | 7 ECTS         |
|                     | Biology and Lab Work  | 7 ECTS         |
|                     | Biologists            | Non-Biologists |

Full time students can complete the programme in [3 semesters](#).

## Course Details

### 1st semester (30 ECTS)

|   | ECTS | CTS No.                |
|---|------|------------------------|
| <b>Mandatory Courses</b>  |      |                        |
| Data production and management  | 3    | <a href="#">104217</a> |
| DNA/RNA sequence analysis   | 3    | <a href="#">104219</a> |
| Applied biostatistics I. With practicals.                               | 4    | <a href="#">104207</a> |
| Modelling I. With practicals.   | 4    | <a href="#">104218</a> |
| Lecture Series and Journal Club   | 2    | <a href="#">104220</a> |
| Question and answer session to Bioinformatics and Computational Biology | 0    | <a href="#">104685</a> |
| <b>Elective Courses</b>   | 7    |                        |
| <b>For Biologists</b>   |      |                        |
| Introduction to UNIX/Linux and scripting with Python and R              | 2    | <a href="#">103913</a> |
| Basic programming for non-informaticians. With practicals.              | 5    | <a href="#">104189</a> |
| <b>For Non-Biologists</b>   |      |                        |
| Molecular biology and genetics for non-biologists                       | 7    | <a href="#">104206</a> |

### 2nd semester (30 ECTS)

|  | ECTS | CTS No.                |
|--|------|------------------------|
| Applied biostatistics II. With practicals.           | 4    | <a href="#">104224</a> |
| Cellular and genetic networks                        | 3    | <a href="#">11470</a>  |
| Eukaryotic gene expression                           | 3    | <a href="#">2218</a>   |
| Modelling II. With practicals.                       | 4    | <a href="#">104285</a> |
| Machine learning in bioinformatics. With practicals. | 4    | <a href="#">104287</a> |
| Evolutionary genomics                                | 3    | <a href="#">104225</a> |
| Cancer genomics                                      | 3    | <a href="#">104243</a> |
| Mass spectrometry to systems biology                 | 2    | <a href="#">104283</a> |
| Applied biological image processing                  | 2    | <a href="#">104288</a> |
| Lecture and Journal Club series                      | 2    | <a href="#">104220</a> |

### 3rd semester (Master thesis, 30 ECTS)