UNIVERSITÄT BERN

Anhang zum Studienplan für das Masterprogramm Bioinformatics and Computational Biology

(gültig ab 1. August 2023)

Master's in Bioinformatics and Computational Biology: 120 ECTS

Module A (7.5 ECTS)

Course	Code	ECTS
Introduction to UNIX and BASH (lecture with exercises), Fribourg	*Fribourg*	2.5
Basic programming for non-informaticians	104189	5

Module B (7.5 ECTS)

Course	Code	ECTS
Molecular biology and genetics for non-biologists (practicals)	396279	4.5
Molecular biology and genetics for non-biologists	104206	3

Mandatory Courses (72.5 ECTS)

Module "Computer Science"	Code	ECTS
Introduction to R, Fribourg	*Fribourg*	2
Programming with R, Fribourg	*Fribourg*	1
Introduction to Digital Sustainability	466951	1
Introduction to High-Performance Computing	467647	1
Advanced Python	473540	5
Introduction Image Processing	102191	3
Bioinformatic Algorithms	410495	3
Introduction to Artificial Intelligence	472720	5
	Total	**21**

Module "Statistics"	Code	ECTS
Applied biostatistics I (lecture with exercises)	104207	4
Applied biostatistics II (lecture with exercises)	104224	4
Machine Learning, Fribourg	*Fribourg*	5
Stochastic models in bioinformatics, Fribourg	*Fribourg*	3
	Total	**16**

Module "Genomics"	Code	ECTS
Bioinformatics (practical course, in silico), Fribourg	*Fribourg*	3
RNA-Sequencing	467713	3
Cancer Genomics	407009	3
Evolutionary Genomics, Fribourg	*Fribourg*	3
Genome and Transcriptome Assembly	473637	2
Organization and annotation of Eukaryote genomes, Fribourg	*Fribourg*	3
Genomics of Microorganisms	405520	1.5
Metagenomics Data Analysis, Fribourg	*Fribourg*	1
	Total	**19.5**

Module "Bioinformatic Applications"	Code	ECTS
Research Seminar in Bioinformatics, Fribourg & Bern	*Fribourg* / 473642	2
Proteomics and Metabolomics	470248	5
Classical Models in Biology (lecture), Fribourg	*Fribourg*	3
Classical Models in Biology (exercises), Fribourg	*Fribourg*	1
Computational Epidemiology	467294	1.5
Systems Biology	473205	3
Introduction to Precision Medicine	473286	3
	Total	**18.5**

Elective Courses *

Module "Elective Courses"	Code	ECTS
Pattern Recognition	*Fribourg*	5
Introduction to Protein Structure and Protein Homology Modelling §	*Fribourg*§	1.5
Introduction to Docking of Small Molecules to Large Macromolecules and Molecular Graphic §	*Fribourg*§	1.5
Structure and Functions of Host-associated Microbiota	*Fribourg*	3
Molecular Genetics of Model Organism development	*Fribourg*	3
Programmierung 1	2416	5
Beyond genetic inheritance	27339	3
Seminar and journal club in Population genetics and Bioinformatics	10854	2
Theoretical Ecology and Evolution	466571	1.5
Protein Bioinformatics BioPython	472833	1.5
Research Project	473636	7.5

* *Elective courses can be taken to fill existing gaps. Students need to choose courses worth at least 7.5 ETCS in total. Courses are taken primarily from the list. The choice of other courses requires the approval of the Studienleitung.*

§ *Must be taken together*

Bern, 23. Mai 2023

Departement Biologie
Fachbereich Bioinformatik
Der Studienleiter Bioinformatics and Computational Biology:

PD Dr. Rémy Bruggmann

Vom Studienausschuss genehmigt:

Bern, 30. Mai 2023

Im Namen der Phil.-nat. Fakultät
Der Dekan:

Prof. Dr. Marco Herwegh