Bioinformatics and Digital Health

Basic Information

Code: SCI3064

Extent: 20 - 25 credits

Language: English

Teacher in charge: Harri Lähdesmäki

Administrative contact: Study coordinator Päivi Koivunen

Target group: Students interested in developing and applying computational methods in biological, biomedical and bioeconomy applications. In particular, the minor is designed to complement any major in the Life Science Technologies programme, as well as the major Machine Learning and Data Mining.

Application procedure: The minor is open for all master's students at the Aalto University schools of tehcnology.

Quotas and restrictions: No quotas

Prerequisites: No prerequisites for the minor as a whole, some courses may have their own prerequisites.

Content and structure of the minor

The Bioinformatics and Digital Health minor in the Life Science Technologies programme is designed to provide students with competence in bioinformatics and biomedical/health data analysis methods. The minor equips students with skills and tools to develop new computational methods and models and to apply them to real world biomolecular data. Computer practicals are part of most courses ensuring understanding of both theory and practice of the methods.

State-of-the-art methods for analysing next-generation sequencing and other omics data as well as biological networks are part of the curriculum. Examples of research questions studied include predicting drug-target interactions, reconstructing biological networks, identifying disease biomarkers from biomedical and health data, and modelling dynamical behaviour of complex biological pathways.

Structure of the minor

Code	Name	Credits
Compulsory courses (choose minimum of 20 credits):		
MS-E2115	Experimental and Statistical Methods in Biological Sciences	5
CS-E5865	Computational Genomics	5
CS-E5875	High-throughput Bioinformatics	5
CS-E5885	Modelling Biological Networks	5
CS-E5890	Statistical Genetics and Personalised Medicine*	5
CS-E4880	Machine Learning in Bioinformatics*	5
*CS-E5890 and CS-E4880 are lectured every other year (alternating). CS-E5890 is lectured in odd years and CS-E4880 is lectured in even years.		
Elective courses (select as many courses as needed to fulfill the 20-25 credit requirement):		
CS-E3210	Machine Learning: Basic Principles	5
CS-E4830	Kernel Methods in Machine Learning	5
CS-E4820	Machine Learning: Advanced Probabilistic Methods	5

CS-E4840	Information Visualization	5