

Master's program in bioinformatics at Aarhus University

This document provides an overview of the key classes of the Master's program in bioinformatics at Aarhus University, and how to combine them into recommended study programs.

See <http://kandidat.au.dk/en/bioinformatics/> for overall info about the Master's program in bioinformatics at Aarhus University.

See <http://kursuskatalog.au.dk/en/> for course descriptions of individual classes offered at Aarhus University, including the classes in bioinformatics program.

Classes and areas of specialization

The main classes of in the bioinformatics program are organized into three areas that each consists of three classes of 10 ECTS. The areas reflect that bioinformatics is about developing and applying statistical models, algorithms, and computer programs for handling and analysis of biological and biomedical data.

Area	Class	
Algorithms and Programming	Computational Thinking in Bioinformatics	CTiB
	Algorithms in Bioinformatics	AiB
	Elective	
Machine Learning and Data Science	Data Science in Bioinformatics	DSiB
	Statistical & Machine Learning in Bioinformatics	SMLiB
	Elective	
Molecular Evolution and Genomics	Evolutionary Thinking	ET
	Population Genomics	PG
	Elective	

Elective class can e.g. be.

Class		Comments
Projects in Bioinformatics	PIB	Individual 5 or 10 ECTS project
Analysis of GWAS Data with a Focus on Prediction of Complex Phenotypes	NGS	5 ECTS class AU Summer University.
Next-Generation Sequencing	GWAS	5 ECTS class AU Summer University.
High-Performance Computing for Data Analysis	HPC	5 ECTS elective class
Advanced Topics in Genomics	ATiG	10 ECTS elective class
Topics in Bioinformatics	TiBC	10 ECTS elective class
Machine Learning	ML	10 ECTS elective class (CS)
Data Visualization	DV	10 ECTS elective class (CS)
Deep Learning in Image Recognition	DLIR	10 ECTS elective class (CS)

Students are also allowed to follow relevant classes from other Master's programs at Aarhus University.

Recommended Study Programs

A student admitted into the bioinformatics program will have basic skills in (1) mathematics and statistics, and basic skills in either (2a) biological sciences, or (2b) computer science, reflecting that the student's Bachelor's degree can be in a biological, or computational/mathematical oriented discipline.

A student in the bioinformatics program must:

- Follow the **at least 20 ECTS of two areas of specialization**. All students admitted into the bioinformatics program can follow the classes in the Data area, and depending on whether the student has a background in a biological or computational/mathematical discipline, the student can follow the classes in either the Bio or Alg area.
- Follow the class **Computational Thinking in Bioinformatics (CTiB)**, if the student has a background in a biological discipline, or the class **Evolutionary Thinking (ET)**, if the student has a background in a computational/ mathematical discipline.
- Follow **up to 40 ECTS of elective classes**, e.g. the last in their areas of specialization, or the initial class in other areas of specialization.
- Make an individual **Project in Bioinformatics (PiB)**, which can be either 5 or 10 ECTS depending on whether the student follows e.g. the class Next-Generation Sequencing.
- Make a **30 ECTS Master's thesis**.

This can e.g. yield the following recommended study programs:

Study Program:

Semester	Area / Alg	Area / Data	Area / Bio
1	CTiB	DSiB	ET
2	AiB	SMLiB	PG
3	PiB	Elective (TiBC)	Elective (ATiG)
4	Thesis		