UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Analysis of sequencing data A1F

7.5 credits

Course code: BI762A
Version number: 4
Valid from: 1 July 2026
Ratified by: Curriculum Committee for Bioscience
Date of ratification: 25 September 2025

1. General information about the course

The course is provided by the University of Skövde and is named Analysis of sequencing data A1F (Analys av sekvenseringsdata A1F). It comprises 7.5 credits and is a second-cycle course. The level of progression is A1F.

The course is a part of the main field of study in Bioinformatics. It can also be a part of the main field of study in Systems Biology. The disciplinary domain of the course is Natural Sciences.

2. Entry requirements

Entry requirements for this course: attended BV713A Library Preparation and Sequencing Technologies A1N (or the equivalent).

A further requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as the Swedish course English 6 or English level 2. This is normally demonstrated by means of an internationally recognized language test, e.g. IELTS or TOEFL.

3. Course content

This course provides a continuation of "Library preparation and sequencing technologies" and presumes that the student has good knowledge of technical platforms for sequencing, and is familiar with the structure and format of raw sequence data. The course covers the steps of bioinformatic analysis of sequencing data, from low level analysis (such as error correction), through genome assembly, to high level analysis (such as variant calling and analysis of gene expression). Upon completion of the course, the student should have wide and in-depth understanding of relevant analysis problems and algorithms, and have acquired the practical skills necessary for performing such analysis.

4. Objectives

After completed course the student should be able to:

- apply Unix commands to analyse sequencing data,
- perform quality control and error correction of raw sequence data and, in a critical analysis, present results from different tools for this purpose,
- give a detailed account of the principles of how reads can be assembled into genome sequences, with and without using a reference genome, and to perform assembly,
- give a detailed description of the principles for analysis of gene expression based on RNAseq da- ta, perform such analysis, and critically evaluate results from different algorithms used for this purpose,
- describe the principles of analysis of single-cell RNA-seq data and perform such analyses, and
- describe the principles of analysis of metagenomic sequencing data, and perform such analysis.

5. Examination

The course is graded A (Excellent), B (Very good), C (Good), D (Satisfactory), E (Sufficient) or F (Fail).

A final grade of the course is only issued when all the examination parts have been passed and is determined by an average of the grades for the four written assignments. The average value is rounded to the nearest integer (half rounded up) and translated into a final grade of the course.

The examinations of the course consist of the following modes of assessment:

- **Written assignment 1**
  2 credits, grades: A/B/C/D/E/F
- **Written assignment 2**
  2 credits, grades: A/B/C/D/E/F
- **Written assignment 3**
  2 credits, grades: A/B/C/D/E/F
- **Written assignment 4**
  1.5 credits, grades: A/B/C/D/E/F

Students with a permanent disability who have been approved for directed educational support may be offered adapted modes of assessment.

6. Types of instruction and language of instruction

The teaching is comprised of lectures, laboratory sessions, supervision and exercises.

The teaching is conducted in English.

7. Course literature and other educational materials

Scientic articles.

8. Student influence

Student influence in the course is ensured by means of course evaluation. The students are informed about the results of the evaluation and potential measures that have been taken or are planned, based on the course evaluation.

9. Additional information

Further information about the course, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.