UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Advanced AI for Biological Data A1F

7.5 credits

Course code: BI765A
Version number: 2.1
Valid from: 1 January 2027
Ratified by: Curriculum Committee for Bioscience
Date of ratification: 28 May 2026

1. General information about the course

The course is provided by the University of Skövde and is named Advanced AI for Biological Data A1F (Avancerad AI för biologisk data 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 and Bioscience. The disciplinary domain of the course is Natural Sciences.

2. Entry requirements

The course has the following entry requirements: attended BI763A Introduction to AI in Bioinformatics A1N and attended BI764A Bioinformatics Analysis Pipelines for Large-Scale Sequence Data 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 or the equivalent.

3. Course content

This course introduces advanced machine learning methods with applications in biology. Students will learn to apply and evaluate models on unimodal biological data and critically reflect on approaches for integrating multimodal datasets. The course also covers Explainable AI techniques, focusing on how to interpret and communicate complex model outputs in biological contexts through hands-on projects and real-world examples.

4. Objectives

After completion of the course, the student shall be able to:

- explain the application of advanced machine learning algorithms in various biological research contexts,
- apply and evaluate machine learning methods to analyse biological datasets,
- evaluate and preprocess biological data for machine learning workflows,
- interpret biological insights derived from machine learning analyses.

5. Examination

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

A grade for the entire course is only issued when both examination components in the course have been passed and is determined by the grade for the Project presentation.

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

- **Project presentation**
  5.5 credits, grades: A/B/C/D/E/F (determines the final grade)
- **Oral examination**
  2 credits, grades: G/U

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

Teaching consists of lectures, seminars, computer exercises and problem-based learning.

The teaching is conducted in English.

7. Course literature and other educational materials

Scientific articles and web materials. They are listed on a special list provided by the course coordinator.

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.