AI for Biomedical Data Analysis

AI för biomedicinsk dataanalys
2 credits

Single subject course

8FG094

Valid from: 2026 Autumn semester

Determined by	**Main field of study**	
Chairman of The Board for First and Second Cycle Programmes	Medical Biology	
Date determined	**Course level**	**Progressive specialisation**
2025-11-13	First cycle	G1N
Revised by	**Disciplinary domain**	
	Natural sciences	
Revision date	**Subject group**	
	Medical Biology	
Offered first time	**Offered for the last time**	
Autumn semester 2026		
Department	**Replaced by**	
Institutionen för biomedicinska och kliniska vetenskaper		

Specific information

The course is given in English.

Entry requirements

General entry requirements for undergraduate studies and English corresponding to the level of English in Swedish upper secondary education (Engelska 6 or Engelska nivå 2).

Exemption from Swedish.

Intended learning outcomes

Knowledge and Understanding

Upon completion of the course, students will be able to:

- Demonstrate an understanding of the principles underlying the application of Artificial Intelligence (AI) in biomedical data analysis.
- Explain and critically evaluate common AI methods and assess their appropriateness for different types of biomedical data.

Skills and Abilities

Upon completion of the course, students will be able to:

- Justify the selection of suitable AI methods based on a defined biomedical problem and the characteristics of the available data.

Judgement and Approach

Upon completion of the course, students will be able to:

- Critically analyze the limitations and challenges associated with applying AI to biomedical problems.

Course content

The course introduces fundamental concepts and approaches in Artificial Intelligence (AI) as applied to biomedical data. This foundational understanding is used to justify the application of AI and to translate relevant formulations and concepts into AI-based analyses. Key topics include supervised and unsupervised machine learning, linear and non-linear model types, as well as validation and overfitting. In addition, practical tools are presented to provide an introduction to basic AI-driven analyses of biological data.

Teaching and working methods

At the Faculty of Medicine, student-centred and problem-based learning forms the basis of teaching. The student takes personal responsibility for the learning process through an active engagement to the learning tasks. The course is delivered through online lectures and an individual project assignment.

Examination

The course is assessed through an oral examination based on the individual project assignment. The examination is conducted in English.

Application for examination

Instructions on how to apply for examinations are given prior to the beginning of each course.

Re-examination

The date for re-examination should normally be announced by the date of the regular examination at latest; in which case the scope must be the same as at the regular examination.

Examination for students with disabilities

If the LiU coordinator for students with disabilities has granted a student the right to an adapted examination for a written examination in an examination hall, the student has the right to it.

If the coordinator has recommended for the student an adapted examination or alternative form of examination, the examiner may grant this if the examiner assesses that it is possible, based on consideration of the course objectives.

An examiner may also decide that an adapted examination or alternative form of examination if the examiner assessed that special circumstances prevail, and the examiner assesses that it is possible while maintaining the objectives of the course.

Nomination of another examiner

A student who has taken two examinations in a course or a part of a course without obtaining a pass grade is entitled to the nomination of another examiner, unless there are special reasons to the contrary.

Grades

Two-grade scale, U, G

Course literature

There is no mandatory course literature.

Other information

Planning and implementation of the course is to be based on the wordings in the course syllabus. A course evaluation is compulsory for each course and should include how the course is in agreement with the course syllabus. The course coordinator will analyse the course evaluation and propose appropriate development of the course. The analysis and proposal will be returned to the students, the Director of Studies, and as needed to the Education Board, if related to general development and improvement.

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

If the course is cancelled or undergoes major changes, examination is normally offered under this course syllabus, at a total of three occasions, within/in connection to the two following semesters, of which one in close proximity to the first examination.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.