Bioinformatics

Single subject and programme course

6 credits

Bioinformatik

732A51

Valid from: 2013 Autumn semester

Determined by
The Quality Board at the Faculty of Arts and Sciences

Date determined
2014-11-18

Revision date
2014-11-18

Main field of study
Statistics

Course level
Second cycle

Advancement level
A1X

Course offered for
- Master´s Programme in Statistics and Data Mining
- Masters Programme in Statistics and Machine Learning

Entry requirements
For acceptance to the course, the student must have a bachelor's degree with a total of at least 90 ECTS credits (1.5 years of full-time studies) in mathematics, applied mathematics, statistics, bioinformatics or computer science. Basic undergraduate courses in statistics and computer science are required. Documented knowledge of English equivalent to Engelska B/Engelska 6: internationally recognized test, e.g. TOEFL (minimum scores: Paper based 575 + TWE-score 4.5, and internet based 90+TWE-score 20), IELTS, academic (minimum score Overall band 6.5 and no band under 5.5), or equivalent.

Intended learning outcomes
After completion of the course the student should on an advanced level be able to:
- account for concepts in molecular biology and apply various techniques used for generating data.
- account for major algorithms and principles of statistical models used for analysis of high-dimensional molecular data.
- apply some of the most important bioinformatics and statistical software tools to real molecular data examples.

Course content

The course introduces basic molecular biology concepts and how to analyze data with bioinformatics and statistics. More specifically, the course
includes:
- Basics of molecular biology and genetics
- Hidden Markov models, genetic sequence analysis

- Sequence similarity, sequence alignment
- Phylogeny reconstruction

- Quantitative trait modelling
- Microarray analysis
- Network biology

Teaching and working methods

The teaching comprises lectures and computer exercises. The lectures are devoted to presentations of concepts and methods. The computer exercises provide practical experience of bioinformatics and statistical software usage for analysis of molecular genetic data. Homework and independent study are a necessary complement to the course. Language of instruction: English

Examination

Written reports on computer exercises. One final written or oral examination. Detailed information about the examination can be found in the course's study guide.

Students failing an exam covering either the entire course or part of the course twice are entitled to have a new examiner appointed for the reexamination.

Students who have passed an examination may not retake it in order to improve their grades.

Grades

ECTS, EC

Other information

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus.

The course is carried out in such a way that both men´s and women´s experience and knowledge is made visible and developed.

Department

Institutionen för datavetenskap