Faculty of Science

BINP28, Bioinformatics: DNA Sequencing Informatics I, 7.5 credits

Bioinformatik: DNA-sekvenseringsinformatik I, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus is an old version, approved by Study programmes board, Faculty of Science on 2017-06-30 and was valid from 2017-06-30 , spring semester 2018.

General Information

The course is a compulsory course for a degree of Master of Science (120 credits) in Bioinformatics.

Main field of studies	*Depth of study relative to the degree requirements*
Bioinformatics	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The general aim of the course is that the students should acquire basic skills in the field of bioinformatics.

Knowledge and understanding

On completion of the course the student shall be able to:

- account for the bioinformatics basics of genome-, transcriptome- and amplicon sequencing
- describe bioinformatics analyses in the form of gene prediction, expression analysis, abundance estimation and taxon classification

Competence and skills

On completion of the course the student shall be able to:

- master programming with respect to sequence analysis
- master Linux-based operating systems including command shells
- carry out basic bioinformatics analyses

Judgement and approach

On completion of the course the student shall be able to:

- critically evaluate results from bioinformatics analyses

Course content

Sequencing by means of new methods, such as next generation sequencing, generate large data sets. The course focuses on the application of bioinformatics methods and technologies to analyse such data. The course includes merging of genome-, transcriptome- and amplicon data, and a primary analysis of the results in the form of gene prediction (for genomes), expression analysis (for transcriptomes) as well as abundance estimation and taxon classification (for amplicons). Genes and transcripts are annotated at a basic level.

The students carry out several exercises to understand how command shells function, as well as several programming assignments in Python. During the course, an individual project assignment is carried out, where the students solve problems by means of programming, and get the opportunity to specialise in one or more of the above-mentioned areas.

Course design

The teaching is largely based on teacher-supervised compulsory exercises where the students solve problems using computers. Each subject starts with a lecture about the current area of interest. The course includes a one week compulsory project work, where the student works with a bioinformatics assignment independently. The work is presented in the form of a written project report and an oral presentation.

Assessment

Examination takes place in the form of a written examination as well as compulsory parts. For students who have not passed the regular examination, an additional examination in close connection to this is offered.

In consultation with the Disability Support Services, the examination may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equal to that of a student without a disability. After having consulted the university's section for educational support, the examiner can make a decision about an alternative examination format for such student.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved compulsory exercises, approved examination, and approved project are required.

The final grade is decided through a joining of the results of the examination (40%), the execution of the project (20%) as well as shown understanding and knowledge on the exercises (40%).

Entry requirements

For admission to the course, knowledge corresponding to BINP11 Bioinformatics and Sequence Analysis 7.5 credits, BINP16 Programming in Python 7.5 credits, BIOS13 Modelling of Biological Systems 7.5 credits, as well as BIOS14 Processing and Analysis of Biological Data 7.5 credits, is required. English B/6.

Further information

The course may not be included in a degree together with BINP26 DNA Sequencing Informatics I 7.5 credits.

Subcourses in BINP28, Bioinformatics: DNA Sequencing Informatics I

Applies from H21

2101 DNA Sequencing Informatics, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction

Applies from V18

1701 DNA Sequencing Informatics, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction