Faculty of Science

BINP15, Bioinformatics: Dataprocessing and Analysis, 15 credits

Bioinformatik: Databearbetning och analys, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2014-01-31 and was last revised on 2013-10-30. The revised syllabus applies from 2013-10-30, spring semester 2014.

General Information

Language of instruction: English and Swedish
The course is an optional second-cycle course for a degree of Master in Bioinformatics. The course is also offered as a single subject course. The language of instruction is English.

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 aim of the course is that the student should get practice and experience in processing and analysis of biological data. The student should also carry out a bioinformatic project within some of the many different research areas where bioinformatics is central.

Knowledge and understanding
On completion of the course the student shall be able to:

? account for basic probability theory

? describe basic assumptions for different analyses
? explain advantages and disadvantages with different statistical analyses

Competence and skills
On completion of the course the student shall be able to:

? handle and structure biological data
? suggest appropriate analytical method for different biological data
? master the most common statistical analytical methods and be able to carry out these in an analysis program

? carry out and present a project work within bioinformatics

Judgement and approach
On completion of the course the student shall be able to:

? assess the relevance and reliability of a biological dataset

? work independently and judiciously with biological datasets, and evaluate her or his analytical ability

Course content

The theoretical part of the course contains principles of processing and handling biological data. Introduction to processing and analysis programs. Analytical methods for biological systems e.g. t-test, ANOVA, correlation, regression, chi2, log-linear modelling, logistic regression, survival, and multivariate methods.

The project is carried out with a supervisor within a biomedical or biomolecular research project with a clear bioinformatic imprint. The project can be carried out either at the faculty of science or medicine, or at the technical faculty or other relevant faculty, or at a company. Before the project starts, a short project plan should be written. The project should include literature studies that delineate the background of the chosen research assignment, and encompass experimental design, scientific methodology, evaluation of achieved results, report writing and presentation.

Course design

The theoretical part of the course is carried out in the form of lectures and computer exercises and is completed with a written examination. The second part of the course is project-oriented, which e.g. implies that the student carries out a bioinformatic project in consultation with a supervisor. Presentation of the project will be in the

form of a scientific report written in English. The work should be presented orally at a seminar. In addition, a popular scientific summary should be written in Swedish or English.

Assessment

The examination of the theoretical part is carried out in the form of a written examination. For students who have not passed the regular examination, an additional examination in close connection to this is offered. The project-oriented part of the course is examined by evaluation of written and oral presentations of the project.

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.
The grades in the course are Passed with distinction, Passed and Failed. To pass the entire course, an approved examination and an approved project are required. The final grade is based equally on the examination and the project work.

Entry requirements

For admission to the course, an undergraduate degree including at least 180 credits is required. In addition, knowledge corresponding to BINP11 Bioinformatics and Sequence Analysis 7.5 credits, and BINP13 Programming in Perl 7.5 credits, and English 6, are required.

Further information

The course may not be included in a degree together with BIOS12 Processing and Analysis of Biological Data 7.5 credits.

Subcourses in BINP15, Bioinformatics: Dataprocessing and Analysis

Applies from H13

1301   Dataprocessing and Analysis, 15,0 hp
       Grading scale: Fail, Pass, Pass with distinction