Faculty of Science

BINP16, Bioinformatics: Programming in Python, 7.5 credits
Bioinformatik: Programmering i Python, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2015-12-18 and was last revised on 2022-12-05. The revised syllabus applies from 2022-12-05, autumn semester 2023.

General Information

The course is an advanced compulsory course for a degree of Master in Bioinformatics, an advanced compulsory course for a degree of Master of Science in Applied Computational Science with specialization in Biology, and an advanced elective course for a degree of Master of Science in Biology or Molecular Biology.

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Applied Computational Science	A1N, Second cycle, has only first-cycle course/s as entry requirements
Bioinformatics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The general aim of the course is that the students should receive basic skills in programming in general and in Python in particular, with special focus on applications within bioinformatics.

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

- demonstrate basic skills in programming
- describe how programming can be applied on problems within bioinformatics
- describe in general terms how a computer functions
- describe the use of command shells in Unix-like environments.

Competence and skills

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

- master programming in Python at a basic level
- write programmes for simple sequence analysis
- use command shells in Unix-like operating systems.

Judgement and approach

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

- evaluate his/her own skills and ability in relation to the degree of difficulty of a current programming problem.

Course content

The course treats:

- Unix command shell
- The hardware and software of the computer
- Mathematical functions, methods and operators
- Functions, methods and operators for strings and regular expressions
- Conditional statements
- Lists, tuples, sets and dictionaries, how iteration works, and which methods and functions that can be applied on these
- Basic I/O (STDIN, STDERR, STDOUT)
- Functions
- Modules
- Classes and objects
- Application of a number of standard modules/packages, such as Bio for biological applications, cgi for web programming, argparse for parsing of command line, and matplotlib for visualisation of data.

Course design

The teaching consists of lectures, exercises and assignments.. Active participation in and completion of assignments and associated components is compulsory.

Assessment

The assessment is based on the written performance of students in an exam at the end of the course and assignments during the course.

Students who do not pass an assessment will be offered another opportunity for assessment soon thereafter.

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.
For a grade of Pass on the whole course, the student must have passed the exam and the assignments.

The final grade is decided through a weighing of the results of the examination and the assignments.

Entry requirements

For admission to the course, a degree of Bachelor of Science within a scientific, medical, or technical field of study, is required, and English 6/English B.

Further information

The course may not be included in a degree together with BINP13 Programming in Perl 7.5 credits, or NUMA01 Numerical Analysis: programming in Python, 7.5 credits.

Subcourses in BINP16, Bioinformatics: Programming in Python

Applies from H23

2301   Exam - Theory, 4,0 hp
          Grading scale: Fail, Pass, Pass with distinction
2302   Assignments, 3,5 hp
          Grading scale: Fail, Pass, Pass with distinction

Applies from H16

1501   Programming in Python, 7,5 hp
          Grading scale: Fail, Pass, Pass with distinction