CB1050 Python for Biotechnology 7.5 credits

Python för bioteknologi

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for CB1050 valid from Autumn 2024

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Swedish secondary school Mathematics 4

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

On completion of the course the student will be able to

- use web-based and command-line interfaces on a computer to use and create program scripts in Python
- document code development in Markdown and LaTex
- Describe fundamental syntax, data types and structures in Python
- Use logical control flows (branching and iteration)
- Separate code into units (functions, classes, modules) applied to problem solving.
- Use scientific software libraries to develop algorithms, for computing presenting results graphically

Course contents

The course gives basic knowledge in programming in Python in relation to important applications in chemistry and biotechnology

- Introduction to computers and file systems. Terminals and the command line interface.
- Writing documents in LaTeX and Overleaf
- Conda: installation and environments
- Jupyter notebooks
- Datatypes, conditionals, iterations
- File handling and I/O
- Packages and modules
- Functions and classes, object-oriented programming
- Common scientific libraries: Numpy, Scipy, Matplotlib, Seaborn, Pandas
- Machine learning with PyCobra
- Applications to differential equations, molecular dynamics, bioinformatics and data analysis.

Examination

- HEM1 - Homework, 2.0 credits, grading scale: P, F
- LAB1 - Computer assignment, 2.0 credits, grading scale: P, F
- TEN1 - On-campus digital assessment, 3.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.