Hanze University of Applied Sciences Groningen

Course: Biochemistry in Focus — credits: 10

Course code	BFVP22BIOCHEMIE
Name	Biochemistry in Focus
Study year	2023-2024
ECTS credits	10
Language	Dutch, with parts in English
Coordinator	S.M. Nabuurs
Modes of delivery	Project-based learning Tutorial
Assessments	- Other assessment

Learning outcomes

You independently create simple programmes in which you make correct use of libraries and functions, and self-written Python modules

You can calculate with and understand simple mathematical formulas with e.g. logarithms and exponents, and can also apply these in Python programmes

You can visualise data with Python

You have a basic knowledge of chemistry such that you can understand simple chemical structures and perform chemical reaction equations and calculations

You understand the structure of a protein at different levels and visualise a self-chosen protein with the aim of understanding structure and function of this protein at different levels

You know in which databases you can find substantive information about proteins and can use these databases to find the right information and data about the protein in your final product.

Content

In this module, you will master the basics of mathematics and chemistry and start looking at how a protein works through a chemical lens. One way of visualisation is to make graphs in which you show biological data and start describing this data with appropriate mathematical formulas. You write this visualisation in Python. Another way of visualisation is to model chemical reactions, again you can write a python programme for this. Finally, you are going to show what proteins (enzymes) look like and where in the structure the reactions take place. You will create this visualisation using specific software that can visualise protein structures.

By visualising your protein, you can also find out whether a mutation in the gene that codes for this protein can cause problems with its function.

Biologists produce a lot of data with their experiments on proteins. You are going to learn how to visualise and mathematically approach the data from simple experiments. A basic maths class will be offered for this purpose. In this way, the basic chemistry you need in your education is also offered. Your maths and chemistry knowledge is tested through assignments in class.

To make your visualisations, you need knowledge of Python, chemistry and mathematics. To help you master the Python skills, short seminars are offered in which the teacher explains and demonstrates a few things, after which you make your own assignment on the explained material. You hand in these assignments to your teacher, who evaluates them and discusses them with you. These assignments must be completed satisfactorily.

Included in programme(s)

Bio-Informatics

School(s)

Institute for Life Science & Technology