

## Introduction to Biochemistry: Biomolecules (0000155)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

<b>Course size</b>	<i>(nominal values; actual values may depend on programme)</i>		
<b>Credits 5.0</b>	<b>Study time 150 h</b>	<b>Contact hrs</b>	60.0h

### Course offerings and teaching methods in academic year 2021-2022

A (semester 2)	English	Incheon	lecture	45.0h
			seminar: coached exercises	7.5h
			practicum	7.5h

### Lecturers in academic year 2021-2022

Van Haute, Sam	KR01	lecturer-in-charge
Heynderickx, Philippe	KR01	co-lecturer

### Offered in the following programmes in 2021-2022

	crdts	offering
<a href="#">Bachelor of Science in Environmental Technology</a>	5	A
<a href="#">Bachelor of Science in Food Technology</a>	5	A
<a href="#">Bachelor of Science in Molecular Biotechnology</a>	5	A
<a href="#">Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology</a>	5	A

### Teaching languages

English

### Keywords

Structure and function of biomolecules: nucleic acids, amino acids, sugars, lipids, membranes, enzymes

### Position of the course

The course provides insights into the basic concepts of the structures of biomolecules and the relation between structure and function of these molecules. It also provides insights into the basic concepts of enzyme kinetics.

### Contents

- 1 Introduction of chemical and thermodynamic principles in a biochemical context
- 2 Introduction to the structures and cellular context of the molecules of life: nucleic acids, amino acids and proteins, sugars, lipids and nucleic acids
  - The structure and function of amino acids and proteins
  - The structure and function of lipids
  - The structure and function of polysaccharides and glycoproteins
  - The structure and function of nucleic acids
- 3 Introduction to enzymology and enzyme kinetics
  - The role of pH in biochemistry and biochemical reactions and the use of buffers

### Initial competences

This course requires the basic knowledge of general chemistry.

### Final competences

- 1 Have knowledge of general principles, concepts and model systems used in biochemistry and biotechnology, and be able to use of these concepts in simple scientific problem solving.
- 2 Be aware of the importance of biochemistry in supporting other scientific fields within the biotechnology field.
- 3 Be able to describe chemical reactions, bonds and dynamics that take place in reactions between biological macromolecules.
- 4 Be able to describe the structure of the major biomolecules (nucleic acids, amino acids,

polysaccharides) as well as be aware of the structure of lipid membranes.

5 Be familiar with the function of proteins, their role as transporters, their function in membrane integrity of cells and tissues and their role as biological catalysts.

6 Be capable of performing simple calculations that relate to the thermodynamics and characteristics of enzymes and biochemical reactions.

7 Adopt an attitude that reflects scientific curiosity as a driver of life-long learning.

8 Be familiar with professional scientific language used in the field of biochemistry.

#### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

#### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

#### **Teaching methods**

Practicum, Lecture, Seminar: coached exercises

#### **Learning materials and price**

Learning material is provided as PowerPoint presentation

#### **References**

Berg, Tymoczko, Gatto, Stryer. Biochemistry (7th or 8th Edition) W.H. Freeman and Company, New York.

#### **Course content-related study coaching**

Practical courses and guided exercises are designed to directly support the biochemical principles outlined in the course

#### **Assessment moments**

end-of-term assessment

#### **Examination methods in case of periodic assessment during the first examination period**

Written examination with open questions

#### **Examination methods in case of periodic assessment during the second examination period**

Written examination with open questions

#### **Examination methods in case of permanent assessment**

#### **Possibilities of retake in case of permanent assessment**

not applicable

#### **Extra information on the examination methods**

Final exam: a written test with open questions.

Practical exam: a test about the practical course material will test the knowledge of the student.

#### **Calculation of the examination mark**

Final written examination about the lecture course material (theory+exercises) – 85%

Active participation in practical courses + written examination related to the practical course experiments – 15%