

Introduction to Life Sciences (C003390)

Course size *(nominal values; actual values may depend on programme)*

Credits 5.0 **Study time 150 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 2) Dutch Gent lecture

Lecturers in academic year 2024-2025

Vandenabeele, Peter WE14 lecturer-in-charge
Declercq, Wim WE14 co-lecturer

Offered in the following programmes in 2024-2025

	crdts	offering
Bachelor of Science in Biochemistry and Biotechnology	5	A
Bachelor of Science in Mathematics	6	A

Teaching languages

Dutch

Keywords

Life, origin, evolution, cell biology, molecular biology, biochemistry, biotechnology, introduction to

Position of the course

The course aims at introducing crucial concepts and insights in the origin and evolution of life on earth, the organisation of life, the building blocks of life, the energy conversions in life, inheritance and expression of genes. The course is situated at the interface between molecular biology, genetics, biochemistry, microbiology and cell biology. At the start of studies in Biochemistry and Biotechnology a number of crucial topics are raised that form a guideline and permanent background for the further bachelor educational program. What is life? (reproduction, metabolism, evolution) How have molecules of life evolved and became organised in higher and more complex molecular structures? How have cells originated and how did they evolve to pluricellular forms of life. How did insights in the fundamental molecular processes of life give rise to techniques and approaches in biotechnology? The unifying, evolutionary, biochemical, genetic, cell biological concepts of life should trigger the student to acquire an overview and insights in the basics of a complex phenomenon such as "life".

Contents

Overview of the course. The evolutionary framework of biology. The history of concepts in biology about the origin and evolution of life. Chemistry of life. The cell as the unity of life. The organisation of the prokaryotic and eukaryotic cell. Cellular membranes. The energy metabolism. Photosynthesis. Chromosomes, mitosis, meiosis, cell cycle, cell death. Mendelian genetics. Molecular genetics. Principles of gene regulation and gene expression in prokaryotes, eukaryotes and viruses. (If time allows it Cellular signalling and communication. Principles of recombinant DNA technology. Biomedical applications. Applications in agriculture).

Initial competences

Secondary education.

Final competences

- 1 Insights and knowledge of concepts of the evolution of life, biochemistry, genetics and cell biology, molecular biology.
- 2 Insights in the coherence between biochemistry, molecular biology, genetics and

cell biology.

3 Insight how this knowledge gave rise to biotechnology applications.

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

Lecture, Independent work

Study material

Type: Syllabus

Name: Introduction to the Life Sciences

Indicative price: € 35

Optional: no

Language : Dutch

Number of Pages : 600

Available on Ufora : No

Available through Student Association : Yes

Additional information: Course contains lots of figures and is not densely typed

Type: Slides

Name: Introduction to the Life Sciences

Indicative price: Free or paid by faculty

Optional: no

Language : Dutch

Number of Slides : 800

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

Type: Audiovisual Material

Name: depending on the topic

Indicative price: Free or paid by faculty

Optional: no

Language : English

Available on Ufora : Yes

Online Available : Yes

Available in the Library : No

Available through Student Association : No

References

Life, the science of biology. 7th Edition. 2004. Purves, Sadava, Orians, Heller. Sinauer Associates, Inc. evolving. Molecules, Mind and Meaning Life evolving. Molecules, Mind and Meaning. Christian de Duve; Oxford University Press
Constructing a cell, Christian de Duve. Wat we nog niet weten. John Maddox.

Course content-related study coaching

Powerpoint presentations are available; questioning and discussion are encouraged; the studying of the course is guided by means of a list of actual questions on the syllabus.

Assessment moments

end-of-term and continuous assessment

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

Written assessment with open-ended questions

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

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Participation

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Written exam (general questions, complete missing text or annotate figures).

Calculation of the examination mark