GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Cellular and Molecular Biology (C003712)

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

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)	English	Gent	practical
			lecture
			peer teaching

Lecturers in academic year 2024-2025

Nowack, Moritz	WE09	lecturer-in-charge
Goormachtig, Sofie	WE09	co-lecturer

Offered in the following programmes in 2024-2025	crdts	offering
Bridging Programme Master of Science in Bioinformatics(main subject Engineering)	6	A
Master of Science in Bioinformatics(main subject Engineering)	6	A
Exchange Programme in Bioinformatics (master's level)	6	A
Linking Course Master of Science in Bioinformatics	6	A

Teaching languages

English

Keywords

Molecular biology, DNA, RNA, genes, proteins, translation, transcription, cell division, genetics, molecular evolution, cell death.

Position of the course

This course introduces the basic concepts of molecular biology in a general and concise way. The course is tailored towards students with a mathematically oriented background (engineers, informaticians, etc.) that pursue a Master in Bioinformatics or any other master that aims at the analysis of cellular or molecular data. The course aims at giving a broad overview of the general principles needed to understand the processes that are measured by molecular 'omics data.

Contents

- Cellular structure
  - Chemistry of life (DNA, proteins, ...)
  - Cellular structure (eukaryotic and prokaryotic cell)
  - Membrane Structure and Function
- Physiology
  - An Introduction to Metabolism
  - Cellular Respiration
  - Photosynthesis
  - Cell Communication
  - Cell Cycle
  - Cell Death
- Molecular evolution
  - Replication
  - Transcription
  - Translation
  - Regulation
- Genetics
  - Clonal reproduction

- Meiosis and Sexual Life Cycles
- The Gene Idea
- The Chromosomal Basis of Inheritance
- The Molecular Basis of Inheritance
- The concepts of evolution
- Basic biotechnology
  - The course will include an on-site visit to a wet lab in which basic molecular technologies will be demonstrated.

Initial competences

none

Final competences

1 Broad knowledge of cell biology, molecular biology and genetics.
2 To be able absorb knowledge of an unfamiliar domain in an independent way.
3 Communication skills in English.
4 Positive attitude toward lifelong learning.
5 Able to communicate about science in an oral and written way

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, Practical, Peer teaching

Study material

Type: Handbook

Name: Campbell Biology, 12th edition
Indicative price: € 75
Optional: yes
Language : English
Author : Lisa A. Urry, Michael L. Cain,Steven A. Wasserman, Peter V. Minorsky, Rebecca Orr
ISBN : 978-0-13598-804-6
Oldest Usable Edition : 11
Online Available : Yes
Available in the Library : Yes
Additional information: "Campbell Biology, 12th edition" can be purchased as a text book or accessed as an ebook, see e.g. https://www.pearson.com/en-us/subject-catalog/p/campbell-biology/P200000007019/9780135988046

Type: Slides

Name: PDF copies of the slides discussed in every lecture
Indicative price: Free or paid by faculty
Optional: no
Language : English
Available on Ufora : Yes
Additional information: We will provide PDF copies of the slides that will be discussed in every lecture.

References

Campbell, Biology - most recent edition, Pearson, chapters 1-19

Course content-related study coaching

Additional information through Ufora

Assessment moments

end-of-term and continuous assessment

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

Written assessment

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

Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

• Periodic evaluation: written examination with closed book
• Non-periodic evaluation: graded oral presentation (micro-teaching) and homework

Calculation of the examination mark

60% periodic evaluation (written exam); 40% non-periodic evaluation (20% on presentation and 20% on assignments that have to be handed in 2 weeks after each lecture)