

Microbes in Biotechnology (C004394)

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

Credits 6.0

Study time 150 h

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)

English

Gent

lecture

seminar

Lecturers in academic year 2024-2025

Joossens, Marie

WE10

lecturer-in-charge

Callewaert, Nico

WE10

co-lecturer

Rabaey, Korneel

LA25

co-lecturer

Saelens, Xavier

WE10

co-lecturer

Van Bogaert, Inge

LA25

co-lecturer

Offered in the following programmes in 2024-2025

[Master of Science in Bioinformatics\(main subject Systems Biology\)](#)

crdts 6

offering A

[Master of Science in Biochemistry and Biotechnology](#)

6

A

[Exchange programme in Biochemistry and Biotechnology \(master's level\)](#)

6

A

Teaching languages

English

Keywords

Applied microbiology, microbial biotechnology, industrial microbial applications, microbial engineering, microbial community manipulation

Position of the course

This course is given in the last year of the master in biochemistry and biotechnology, in the major microbial biotechnology. This course aims at concretizing and illustrating applications of microbial biotechnology in practice, in a wide range of fields. The aim of the course is to familiarize the students with the biotechnological applications of microorganisms in our current and future society.

Contents

A combination of academic experts and speakers from industry will present a changing selection of the following topics:

- Human microbiome as medicinal tool
- Probiotic cocktails and fecal microbial transfer
- Phage therapy
- Biotechnology of fungi
- Yeast genetics for fundamental eukaryotic biology analysis
- Beer brewing as case study of a yeast-based microbial production process
- Protein production
- Water purification
- Microbial biosurfactants
- Introduction to industrial biotechnology
- Microbial production of amino acids and organic acids
- Synthetic (micro) biology
- Bioresource recovery processes
- Composting
- Fermentation
- Bio-metallurgy

- (Bio)electrochemistry
- Antiviral antibodies/vaccines
- Synthetic (micro)biology
- Dairy production at industry level
- Industrial beer production
- Probiotics in veterinary medicine
- Bacteria in cleaning products
- Probiotics in cosmetics
- Production of Kombucha
- Bubble tea and microbial therapy

Initial competences

Basic scientific knowledge of molecular biology, biotechnology, gene technology, biochemistry and microbiology (level 3rd Bachelor Biochemistry-Biotechnology).

Final competences

The student will have insight into the versatility of microbial biotechnological applications. Per modules, the students receive the specific learning objectives of that specific module.

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

Seminar, Lecture

Extra information on the teaching methods

30.0h Lectures are organized in modules where students are taught by experts per specific module.

5-hour study visit and / or seminar: company visit in addition to the topics and / or interactive discussion on scientific articles on microorganisms as a source of new businesses and employment. Attendance at the study visit and / or seminar is mandatory.

Study material

Type: Slides

Name: printed slides for open book exam

Indicative price: € 10

Optional: no

Language : English

Number of Slides : 850

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

Type: Excursion

Name: transport for company visit

Indicative price: € 5

Optional: yes

References

If applicable, additional, non-compulsory literature will be presented per module.

Course content-related study coaching

Interactive support during and right after class, via UFORA (forums, e-mail) or in person by appointment. Support/appointments can also be done via MS Teams.

Assessment moments

end-of-term 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

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Written open book exam with open questions.

Calculation of the examination mark

100% Periodic evaluation

Anyone who withdraws from the seminar and/or study visit cannot pass the course.

A student who is absent without reason will receive a non-deliberable final score.