

Technologies for Alternative Proteins (I002956)

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

Credits 3.0 **Study time 90 h**

Course offerings in academic year 2025-2026

A (semester 1) English Gent

Lecturers in academic year 2025-2026

Moens, Kim	LA23	staff member
De Smet, Stefaan	LA22	lecturer-in-charge
Rolandelli, Guido	LA23	co-lecturer
Van Bockstaele, Filip	LA23	co-lecturer
Vlaeminck, Siegfried	UA	co-lecturer

Offered in the following programmes in 2025-2026

Master of Science in Bioscience Engineering: Sustainable Urban Bioscience Engineering	crdts	offering
	3	A

Teaching languages

English

Keywords

Position of the course

Contents

This course provides an overview of the most important technological and non-technological aspects related to a transition to more sustainable food systems, with a focus on the production and processing of alternative proteins within the frame of the protein shift. Where applicable, features will be compared to the conventional animal-derived and plant-based protein sources. Several alternative protein sources will be discussed for food and feed applications. Both production and processing stages will be covered. A deeper characterization of nutritional, functionality and safety properties will focus on product usage as food ingredients.

1. Introduction to drivers and needs for the protein transition, in a local and a global context.

2. Characteristics and technology routes for alternative protein production and processing for food and feed.

1. Plant-based proteins, e.g. legumes, ... (postharvest processing only)

2. Aquatic protein sources, e.g. seaweed, duckweed, ...

3. Insects, e.g. mealworm

4. Microbial proteins, including microalgae

5. Animal- and plant-based cellular agriculture, e.g. cultured meat

3. Nutrition, functionality and safety of alternative proteins for food.

4. Economic and environmental sustainability aspects and consumer, regulatory (incl. novel food) and policy aspects of producing and consuming alternative proteins, in a local and a global context.

Initial competences

Final competences

1 Understands the drivers and needs for the protein transition, the food system complexity in relation to resources required, associated environmental emissions and other sustainability aspects.

- 2 Has application-oriented insights to conceptually represent processes and systems in the food supply chain.
- 3 Has a general understanding of the technological aspects for production and processing of alternative proteins.
- 4 Is able to analyse and compare the nutritional, functional, and safety properties of alternative proteins.
- 5 Is able to conceptually analyse the sustainability, acceptance and demand of alternative proteins and their role in food systems considering economic and environmental aspects, along with consumer, legislation and policy aspects, both in a local as in a global context.

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

Excursion, Lecture, Independent work, Peer teaching

Extra information on the teaching methods

This course unit includes a limited number of lectures and lab demonstrations, and possibly one or more company visits. Participation in the lab demonstrations and company visits is mandatory.

Furthermore, this course unit consists of independent work in which a presentation on one particular alternative protein source is prepared and then given to fellow students through peer teaching.

Study material

Type: Slides

Name: Slides and supporting texts

Indicative price: Free or paid by faculty

Optional: no

Language : English

Available on Ufora : Yes

Type: Excursion

Name: Lab demonstrations @UGent and company visits

Indicative price: € 100

Optional: no

Additional information: For certain classes and lab demonstrations @UGent and for any company visits, students must arrange their own transport.

References

- Sustainable food production - <https://www.springer.com/gp/book/9781461457961>
- Sustainable food and agriculture: An integrated approach -<https://www.elsevier.com/books/sustainable-food-and-agriculture/campanhola/978-0-12-812134-4>
- Sustainable food systems from agriculture to industry -<https://www.elsevier.com/books/sustainable-food-systems-from-agriculture-to-industry/galanakis/978-0-12-811935-8>
- Imagining sustainable food systems - <https://www.routledge.com/Imagining-Sustainable-Food-Systems-Theory-and-Practice-1st-Edition/Blay-Palmer/p/book/9781138246874>
- Healthy and sustainable food systems - <https://www.routledge.com/Healthy-and-Sustainable-Food-Systems/Lawrence-Friel/p/book/9780815393276>

Course content-related study coaching

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, Written assessment

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

Written assessment with open-ended questions, Written assessment

Examination methods in case of permanent assessment

Presentation, Peer and/or self assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

The evaluation will be divided as follows:

- Written examination: 60%
- Assignment, presentation and peer assessment: 40%

The student needs to pass for both parts to receive a credit for this course.

If the student fails this course, he/she/they will get another chance in the second examination period. Partial exemptions can be applied for.

Calculation of the examination mark