ENG-436 **Food biotechnology**

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Cursus	Sem.	Type
Biotechnology minor	E	Opt.
Ing.-chim.	MA2, MA4	Opt.

Language of teaching	English
Credits	2
Session	Summer
Semester	Spring
Exam	Written
Workload	60h
Weeks	14
Hours	**2 weekly**
Courses	2 weekly
Number of positions	

Summary

The course will deliver basic knowledge on the principles of food fermentation and enzyme technology. The course will also present benefits that food biotechnology can bring in terms of Nutrition & Health and Sustainability.

Content

- History of fermentation
- Different types of food fermentation
- Enzyme technology (Protease, Lipases, Carbohydrases)
- Practical examples and benefits generated
- Probiotics, Prebiotics and Postbiotics
- Sustainable Protein Production (Meat, Dairy and Fish replacers)
- Genetically Modified Food: A curse or a blessing?

Keywords

Biotechnology, fermentation, food, enzyme, probiotics, GM Food

Learning Prerequisites

Required courses

Basic chemistry and biochemistry

Recommended courses

It is recommended to also follow "Chemistry of food processess" by Imre Blank. Both courses will be given in the spring semester on a 4h weekly basis.

Important concepts to start the course

Combines knowledge related to chemistry, biology, food technology and every day products. Interesting to learn how basic fermentation, enzyme technology and biochemistry is applied in food manufacturing to produce safe products with added benefits.

Learning Outcomes

By the end of the course, the student must be able to:

- Describe basic principles of fermentation

- Describe selected fermentation systems
- Understand enzyme action and main classes of enzymes
- Understand factors related to probiotic technology
- Describe selected industrial food biotechnology processs
- Describe selected classical fermentation pocesses
- Describe how fermentation can deliver nutrition
- Describe basic safety aspects of fermentation
- Have a critical thought on the role of food biotechnology in today's world
- Understand sustainable protein sources and technologies

Transversal skills

- Manage priorities.
- Communicate effectively, being understood, including across different languages and cultures.
- Demonstrate the capacity for critical thinking

Teaching methods

Lecture, short exercises, group or individual presentation on specific topic (the presentation will be individually if there are few students, or in group if there are more than 20 students). The presentation will count 20% of the final note.

Expected student activities

Attend lectures. Students will give a 15 minutes presentation during the semester. This presentation will be given alone or in a team of 2, depending on the number of students. A potential visit to Food Hack or Nestlé Research will be decided during the semester.

Assessment methods

The presentation will count 20% of the final note. The written exam will count 80% of the final note.

Supervision

Office hours	No
Assistant.e.s	No
Forum	No
Others	Q&A during the lectures. Short exercises during the lectures.

Resources

Bibliography

Optional: Biotechnology: an Illustrated Primer
Rolf D. Schmid (author), Claudia Schmidt-Dannert (author),Ruth Hammelehle (illustrator),
Paperback (20 Apr 2016)
link is also here:
https://slsp-epfl.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma990106355660205516&context=L&vid=41SLSP

Biotechnology: an Illustrated Primer (link is also here: https://slsp-epfl.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma990106355660205516&context=)

Ressources en bibliothèque

- Find the references at the Library

Notes/Handbook

Electronic PDF Files about Food Biotechnology topics, including slides, scientific articles, flyers and posters from food biotech companies.

Moodle Link

- https://go.epfl.ch/ENG-436