

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC5
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 8
Total : 26

Project :
Personnal work :

ASSESSMENT

1 written exam, 2 oral presentations, 1 project report, 1 lab report; - Final grade = 1/2 CC1 + 1/2 CC2

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Food biotechnology

SCOPE OF THE COURSE

OBJECTIVES

This module enables students to acquire fundamental technical and transversal skills to address multidisciplinary issues related to living organisms, their understanding, and their application in the agri-food sector.

COMPETENCE AND SKILLS

- Mastering different culture modes in bioreactors
- Knowing how to control culture parameters
- Knowing how to optimize biomass, enzyme, or metabolite production
- Understanding the main food applications of green biotechnology
- Understanding metabolic engineering methods applied in particular to enzyme and food ingredient production
- Understanding risk assessment associated with market authorization applications (GMOs, enzymes, technological aids)

PROGRAM

1- Biotechnology : Microorganisms used in biotechnology; Production of ferments and biomass; Enzyme production; Production of ingredients and additives; Construction and characterization of microbial GMOs; GMO assessment and authorizations 2- Case study in PBL (Problem-Based Learning) : Production of an enzyme via microbial route using a genetically modified microorganism 3- Lab work : Implementation, control, and performance comparison of bioreactors (batch and fed-batch; free and immobilized cells)

BIBLIOGRAPHY

REQUIREMENTS

Basic knowledge in microbiology and molecular biology, SDA, Toxicology, Unit operations, Processes and preservation, Additional physics, System regulation, Process engineering, Reactors and bioreactors, Automation