Hanze

Course: Introduction to Industrial Biotechnology — credits: 5

Course code	LSVX24INDUSTRBIO
Name	Introduction to Industrial Biotechnology
Study year	2026-2027
ECTS credits	5
Language	Dutch, with parts in English
Coordinator	N. ten Boer
Modes of delivery	Guest lecture Lecture Practical / Training Teaching method 1
Assessments	Posterpresentation - Other assessment Project - Other assessment

Learning outcomes

This module has the following learning outcomes:

You explain the main concepts and applications of industrial biotechnology.

You identify and describe key biotechnology processes.

You identify the latest innovations and trends in industrial biotechnology and discuss their potential impact on the industry.

You explain the different types of bioreactors and their specific applications.

You explain the main techniques of downstream processing in biotechnological production processes.

You will carry out a small biotechnology project as a team.

You present and report research results effectively.

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Content

In the transition to a sustainable society, many industrial processes are switching from fossil-based to biobased raw materials. This also increasingly offers the possibility of using microorganisms as catalysts in these (bio)conversions. This module introduces the concept of industrial biotechnology, which is also called white biotechnology. In industrial biotechnology, chemicals and materials are made with the help of microorganisms, or with enzymes produced by those microorganisms. An example is the production of bioplastics from biomass, but it also includes the enzymatic bioconversion of, for example, starch into biodegradable films, capsules or coatings. Aspects that (may) be covered in this elective module are: basic knowledge of industrial biotechnology; biotechnological processes; microorganisms and enzymes; bioreactors and equipment; downstream processing; ethical, environmental and safety aspects; innovations and trends in industrial biotechnology.

The industrial biotechnology module consists of the following 3 parts:

Introductory lectures (guest lectures) on the breadth of industrial biotechnology, linking to various regional biotech companies.

Company field trips to regional biotech companies.

Practicum in which specific fermentations are carried out or biochemical conversion with enzymes is studied.

The knowledge acquired during the lectures and the field trip is incorporated into an oral presentation.

The maximum number of students participating in this module is 24. For the company excursions, students are divided into groups of 4 persons. Students can register for a maximum of 2 company excursions. The companies considered are:

Sugar Union

Water purification Garmerwolde

Avebe

Kikkoman

Bax beer / Martinus

IQ Products

During the practical, the results are logged in Elabjournal. These

results form the basis for a lab report on specific fermentations and enzymatic conversions.

Included in programme(s)

Major Medical Diagnostics
Major Biology and Medical Research
Bio-Informatics
Chemistry
Chemical Engineering

School(s)

Engineering, Life Sciences & ICT

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