

**Microbial Biotechnology**

Code: 42900  
ECTS Credits: 9

Degree	Type	Year	Semester
4313772 Advanced Biotechnology	OB	0	1

## Contact

Name: Antonio Pedro Villaverde Corrales

Email: antonio.villaverde@uab.cat

## Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

## Teachers

Antonio Pedro Villaverde Corrales

Maria Pilar Cortes Garmendia

Neus Ferrer Miralles

Escarlata Rodriguez Carmona

Esther Vázquez Gómez

Anna Aris Giralt

Jose Luis Corchero Nieto

Elena Garcia Fruitós

## External teachers

Antonio Barreiro Vázquez

Antonio Párraga Tajuelo

Antonio Rodríguez Fernández de Henestrosa

Carla Prat

Jordi Feliu

Lucas Martín

Luis Ruiz

Manuel Rodríguez

Marí Aldea Malo

Patricia Ayma

Remedios Mancebo

## Prerequisites

It is expected to have a good conceptual background in microbial metabolism and physiology, molecular microbiology, microbial cell culture techniques, genetic manipulation of microorganisms and protein engineering.

## Objectives and Contextualisation

The objective of this module is to provide students with an overview of microorganisms of industrial interest, microbial diversity and their potential on an industrial scale in production / transformation processes.

There will also be several microbial products of industrial and biomedical interest, especially proteins, and how microbial cell factories can be used for the production and adaptation of the same for biotechnological and biomedical applications.

## Competences

- Combine knowledge of microbial genetics and physiology with the methodologies of bioprocess engineering in Cell Factory applications .
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Comparatively integrate physiological microbial diversity and the potential application of microbial products and transformations mediated by microorganisms in the biotechnological, pharmaceutical and food industries.
- Handle the biological methodologies and principles that underpin the microbial production of recombinant proteins.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use and manage bibliography and IT resources related to biotechnology responsibly.

## Learning Outcomes

1. Apply basic concepts in microbiology to industrial processes based on biotechnology.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Determine the best genetic strategies for the production of recombinant proteins.
4. Determine the most appropriate type of process for a microbial production strategy.
5. Determine which types of microbial products are potentially of interest in biotechnology.
6. Integrate molecular and physiological tools and strategies in microbial production and transformations.
7. Recognise microbial diversity as a biotechnological offer for the cell factory.
8. Show scientific judgement in choosing the appropriate organism to produce high-quality recombinant proteins.
9. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
10. Use and manage bibliography and IT resources related to biotechnology responsibly.

## Content

- R+D+I to obtain products or microorganisms of industrial interest.
- The Cell Factory concept: microbial production of metabolites, enzymes and recombinant drugs.
- Experimental design in microbial biotechnology.
- Production and engineering of protein drugs and materials of clinical interest.
- Microbiology in different industrial sectors (health, pharmaceutical, agri-food, cosmetics).
- Value and technological transfer of microbial products.

## Methodology

This module consists of expository masterclasses taught by researchers in fields related to Microbiology and Biotechnology, by professionals in these specialties from related industries, and by experts in valorization and industrial transfer. Attendance at 60% of master classes will be required.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	46	1.84	1, 3, 5, 8, 4, 7
Type: Autonomous			
Personal study	135	5.4	1, 3, 5, 8, 4, 6, 9, 7, 10
Preparation of an oral presentation	41.75	1.67	5, 4, 6, 9, 2, 10

## Assessment

The module will be evaluated through an individual written test that consists of two types of questions (test and short questions) and the delivery of a group work and evaluated by oral presentation.

To pass the subject, a weighted average grade of 5 or higher must be obtained, and a grade of 5 or higher in the individual written test. In case of not passing the module, the individual evaluation can be recovered.

To participate in the recovery, students must have been previously evaluated in a set of activities whose weight is equivalent to a minimum of two thirds of the total grade for the subject or module. Therefore, the student body will obtain the qualification of "Not Evaluable" when the evaluation activities carried out have a weighting of less than 67% in the final qualification.

In the event that the student wishes to improve the qualification of the individual evaluation, they will be able to opt for a grade improvement test that will be carried out the same day as the recovery test, giving up the grade

obtained previously in this section. Students who want to take this test must contact the module teachers in writing at least 72 hours before the scheduled day to take the test. It is necessary to get a minimum of 5 to pass it.

To pass the module it is mandatory to attend at least 60% of the theoretical classes.

Single assessment: The single assessment consists of a single individual written test consisting of two types of questions (test and short questions) in which the contents of the entire theory program of the subject will be assessed. The grade obtained in this synthesis test will account for 75% of the final grade for the subject.

The evaluation of the work presentation through oral presentation will follow the same process of the continuous evaluation. The grade obtained will account for 25% of the final grade for the subject.

The same recovery system will be applied as for the continuous evaluation.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation of group assignments: oral presentations	25	0.25	0.01	1, 3, 5, 8, 4, 6, 9, 2, 7, 10
Individual evaluation: multiple choice test	30	1	0.04	1, 3, 5, 8, 4, 6, 9, 7
Individual evaluation: short questions	45	1	0.04	1, 3, 5, 8, 4, 6, 9, 7

## Bibliography

The necessary basic and specific bibliography will be published on the moodle course. The databases will be indicated to obtain the necessary material for the individual works.

## Software

No specific software is foreseen.