Universitat Autònoma de Barcelona

2023/2024

Industrial Microbiology

Code: 44999
ECTS Credits: 9

Degree	Type	Year	Semester
4313775 Applied Microbiology	OB	0	1

Contact

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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

Neus Ferrer Miralles

Esther Vázquez Gómez

Jose Luis Corchero Nieto

Jesus Aranda Rodriguez

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 and how microbial cell factories can be used for the production and adaptation of the same for biotechnological and biomedical applications.

Competences

- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Design tools and strategies based on microorganisms to optimise industrial processes, assess the environmental impact of human activity and recover polluted environments.
- Display knowledge of the most up-to-date methodology used in environmental, molecular, industrial and clinical microbiology.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use and manage bibliographic information and computer resources related to microbiology and related sciences.
- Use scientific terminology to account for research results and present these orally and in writing.

Learning Outcomes

1. Acquire knowledge of the most up-to-date tools and systems used in industrial microbiology and the industrial microbiology-biotechnology interface.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Recognise microbial diversity as an offer of new microorganisms and microbial products that are of interest to industry and the welfare of society.
4. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
5. Use and manage bibliographic information and computer resources related to microbiology and related sciences.
6. Use scientific terminology to account for research results and present these orally and in writing.

Content

-R+D 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. During the module, group work in the classroom will be carried out. 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, 4, 2
Type: Autonomous			
Individual study	135	5.4	1, 3, 4, 2, 5
Preparation of an oral disertation	41.75	1.67	1, 4, 2, 5, 6

Assessment

Attendance of at least 60% of the theoretical classes is compulsory to pass the module.

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 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 take part in the remedial exam, students must have been previously evaluated in a set of activities equaling at least two-thirds of the final score of the course or module. Therefore, the student will be graded as "No Avaluable" if the weighting of all conducted evaluation activities is less than 67% of the final score.

In the event that the students wish 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.

Single assessment:

The single assessment consists of a single individual written test including 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.

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

The single individual test will be held on the same date fixed in the calendar for the last continuous evaluation test. A similar recovery system and criteria for passing the module will be applied, as described for continuous assessment.

Assessment Activities

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

Bibliography

The necessary basic and specific bibliography will be published on the Moodle space of the course.

Software

No specific software is foreseen.