27128 - Microbial Biotechnology

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Course	4
Period	Second semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

1- Acquisition of basic concepts of this subject (3 ECTS)

2- Laboratory work (2 ECTS)

3- Tutorized projects (1 ECTS)

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5.2.Learning activities

Formative activity 1: Acquisition of basic concepts of this subject (3 ECTS)

Methodology: participative lectures which will be accomplished by the use of supporting material available in the ADD web.

Formative activity 2: Laboratory work (2 ECTS)

Methodology: problems and practical cases in the laboratory. This activity will be evaluated in individual and team work.

Formative activity 3: Tutorized projects (1 ECTS)

Methodology: Design of biotechnological processes involving microorganisms. This work will be accomplished by examining the scientific literature and will be performed in groups of 4-7 students.

5.3.Program

Lesson 1. Introduction to microbial biotechnology. Microbial diversity. Taxonomy. Culture type collections

Lesson 2. Applications of microbial biotechnology: human therapeutics, agriculture, food science and technology, environmental applications, daily life

Lesson 3. Genetic manipulations of microorganisms. Synthetic Biology, Omic disciplines

Lesson 4. Protein expression and purification in bacteria and fungi. Biocatalysis

Lesson 5. Microbial biopolymers (polysaccharides and polyesters)

Lesson 6. Primary metabolites (organic acids, vitamins and aminoacids)

Lesson 7. Secondary metabolites. Antibiotics (detection, genetic improvements, scaling, purification) and hormones

Lesson 8. Food fermentations (wine, beer, dairy products)

Lesson 9. Vaccines

Lesson 10. Applications in diagnostics and bioterrorism

Lesson 11. Biofuels and ethanol production

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Lesson 12. Agriculture. Biomass (interactions plant-microorganism, mycorrhizae, bioremediation, *Bacillus thuringiensis*). Biodegradation. Wastewater treatment

5.4.Planning and scheduling

Lectures will take place during the second half of the academic course. Schedules can be downloaded from:

https://ciencias.unizar.es/grado-en-biotecnologia

These lectures will be imparted according to the Academic Schedule aproved by the University of Zaragoza.

Problems and Seminars will take place during the aforementioned schedule for the Lectures. The deadline to submit works performed by the students is 30th May.

Concerning laboratory sessions and groups, this information will be notified in the classrom and through the ADD web.

5.5.Bibliography and recomended resources

https://psfunizar7.unizar.es/br13/egAgenda_guia2.php?codigo=27128&year=2015

BB	Alexander N. Glazer. Microbial Biotechnology: Fundamentals of Applied Microbiology . 2nd 2007