Course guide
33111 - EBATR - Bioresources Engineering Applied to the Waste Treatment

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.
Degree: MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING (Syllabus 2015). (Optional subject).
Academic year: 2023  ECTS Credits: 5.0  Languages: Spanish

LECTURER
Coordinating lecturer: M. MONTSERRAT SOLE SARDANS - ANTONIO DAVID DORADO CASTAÑO
Others: ANTONIO DAVID DORADO CASTAÑO - M. MONTSERRAT SOLE SARDANS -

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES
Specific:
1. The ability to design natural biotechnological processes for eliminating pollutants in solid, liquid and gaseous media.

General:
2. The ability to take the initiative and be creative.
3. The ability to communicate effectively orally and in writing.

TEACHING METHODOLOGY
Lectures, which cover the content of the subject and in which students' active participation is encouraged.

Problem-solving classes and classes involving practical cases.

Technical visits to wastewater and waste gas treatment plants. Debate in the classroom on activities carried out beforehand.

LEARNING OBJECTIVES OF THE SUBJECT
1. To revise some of the environmental applications of biotechnology. To become familiar with the biotechnological processes used in industry.

2. To describe techniques for gaseous pollutants abatement using biological systems.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>66.67</td>
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<tr>
<td>Hours medium group</td>
<td>15,0</td>
<td>33.33</td>
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</tbody>
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Total learning time: 45 h
CONTENTS

Subject Area I. Biological processes: applications in wastewater and waste treatment

Description:
1. Introduction to environmental biotechnology
2. Biological treatment of wastewater
3. Biological treatment of waste
4. Biodegradation of xenobiotic compounds
5. Biosorption of metals. Bioleaching

Full-or-part-time: 22h 30m
Theory classes: 15h
Practical classes: 7h 30m

Subject Area II. Techniques for gaseous pollutants abatement using biological systems Competencies of the degree to which the subject contributes

Description:
1. Introduction
2. Non-biological methods
3. Biological treatment of gases and odours

Full-or-part-time: 22h 30m
Theory classes: 15h
Practical classes: 7h 30m

GRADING SYSTEM

Assignments handed in during the course (bibliographic research, comments on articles, exercises and problems): 30%
Written tests 1: 25%
Written tests 2: 25%
Individual bibliographic research assignment: 20%
BIBLIOGRAPHY

Basic: