

Course guide

33111 - EBATR - Bioresources Engineering Applied to the Waste Treatment

Last modified: 06/06/2024

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: 2024 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: XAVIER GAMISANS NOGUERA
Others: XAVIER GAMISANS NOGUERA
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.

Generical:

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

TEACHING METHODOLOGY

On-site Modality

Explanatory classes where the course content will be covered and active student participation in the classroom will be encouraged.

Problem-solving and case study classes.

Technical visits.

Practical activities (deliverables): Students will have to complete the practical activities proposed by the teachers, where they will have to apply the knowledge acquired from the content. These activities include exercises or problems, assignments, case studies, and simulations. Classroom debates will be held based on these activities completed by the students and reviewed by the teachers.

Online Modality

Students will have access on the ATENEA Platform to:

Recorded classes, presentations commented on by the course teachers, and specific videos.

Guided readings: Readings that include reflection questions and key points to consider.

Practical activities (deliverables): Students will have to complete the practical activities proposed by the teachers on the ATENEA platform, where they will have to apply the knowledge acquired from the content. These activities include exercises or problems, assignments, case studies, and simulations, and will be submitted to the teacher through the ATENEA platform. Once reviewed, they will be returned to the students with corrections/comments.

If necessary, virtual mentoring will be held to resolve any doubts.

LEARNING OBJECTIVES OF THE SUBJECT

1. Understand the basic principles of environmental biotechnology.
2. Apply biotechnological techniques to solve environmental problems.
3. Promote the sustainable use of natural resources through biotechnology.
4. Foster research in environmental biotechnology.
5. Apply the acquired knowledge in the valorization/treatment of contaminated effluents and waste.

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	66.67
Hours medium group	15,0	33.33

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. 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

EVALUATION (ON-SITE MODALITY)

Deliverable activities during the course (exercises or problems, assignments, case studies, simulations, bibliographic research): 30%

Written exam content 1: 25%

Written exam content 2: 25%

Individual work: article commentary and oral presentation: 20%

EVALUATION (ONLINE MODALITY)

Deliverable activities during the course (exercises or problems, projects, case studies, simulations, bibliographic research): 30%

In-person and individualized written exam on the content: 50%

Individual work: article commentary and oral presentation: 20%

BIBLIOGRAPHY

Basic:

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- Jagnow, G.; Dawid, W. Biotecnología: introducción con experimentos modelo. Zaragoza: Acribia, 1991. ISBN 842000698X.

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- Rittmann, B. E.; McCarty, P. L. Biotecnología del medio ambiente: principios y aplicaciones. Madrid: McGraw-Hill, 2001. ISBN 8448132807.

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