Universidad Zaragoza

Academic Year/course: 2024/25

25226 - Management, treatment and recovery of waste

Syllabus Information

Academic year: 2024/25
Subject: 25226 - Management, treatment and recovery of waste
Faculty / School: 201 - Escuela Politécnica Superior
Degree: 571 - Degree in Environmental Sciences
ECTS: 6.0
Year: 3
Semester: Second Four-month period
Subject type: Compulsory
Module:

1. General information

The general objectives of this subject are:

- To know the main types of waste, its origin and environmental impact, as well as the main management operations from its generation to its final destination.

- To develop criteria to propose, for a given type of waste, the most appropriate management scheme, selecting among the different treatment and minimization techniques according to existing conditions, adapting to management plans or programs established at European, state or regional level.

These goals are aligned with the SDGs of the 2030 agenda; especially with SDG 11 (Objective 11.6), SDG 12 (Objective 12.4 and 12.5) and SDG 3 (Objective 3.9).

It is advisable to have passed subjects of the first and second year of the Degree, related to the basics of environmental engineering, water, soil and atmospheric pollution.

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

1. Foresee the generation of different types of waste.
2. Classify and characterize the different types of waste and assign possible sources of origin.
3. Know the environmental problems associated with waste and its incorrect management.
4. Select the most appropriate treatments for each specific case.
5. Know and know how to apply the waste regulations applicable to each specific case.
6. Program and design waste minimization and management strategies.
7. Analyse and evaluate implemented waste management plans or programs.

All of these learning results are part of Sustainable Development Goals 11: Sustainable cities and communities and 12: Responsible production and consumption.

3. Syllabus

BLOCK 1: INTRODUCTION

1. Sustainable Development Goals
2. General waste concepts
3. Basic waste regulations
4. Management plans

BLOCK 2: HOUSEHOLD AND COMMERCIAL WASTE

1. Household and commercial waste management in Aragon
2. Characteristics, composition and properties of household and commercial wastes
3. Packaging management
4. Separation, processing, transformation and disposal of household and commercial waste

BLOCK 3. INDUSTRIAL WASTE

1. Industrial waste: identification and characterization

2. Non-hazardous industrial waste management. Regulations

3. Hazardous waste management. Regulations, physical-chemical treatments and disposal

4. Treatment of Residual Organic Matter. Composting and biomethanization

4. Academic activities

Master classes: 30 hours

Theoretical sessions in which the contents of the subject will be explained

Seminars: 10 hours

Resolution of cases related to the topics of the subject.

Laboratory practices: 8h

Laboratory sessions related to waste treatment

Collaborative group work: 2h

Group session for the presentation of the work on planning an overall waste management strategy in an industrial activity.

Visits to facilities: 10h

Visits to waste management facilities

*These activities are subject to the budget available for their implementation

Autonomous student work (86h) and evaluation (4h)

5. Assessment system

The subject will be evaluated by means of a global evaluation with the following activities to be carried out on the dates established by the center:

Test 1. Individual written test of theory (50% of the final grade)

It will include multiple-choice and theoretical-practical questions (short and developmental questions) on topics covered in lectures and visits to facilities. No documentation of any kind other than that provided in the exam will be allowed for its completion. Minimum grade to average with the rest of the tests: 4

Test 2. Individual written practical exam (30% of the final grade)

It will include short questions on laboratory practices (10%) and seminars (20%). It will be developed in computer classrooms, using computers and the use of any documentation other than that provided in the exam will not be allowed. Minimum grade to average with the rest of the tests: 4. In the case of attending and handing in the reports corresponding to these practicals, this test will account for 15% of the final mark, the other 15% being the evaluation mark of these reports.

Test 3. Collaborative group work (20% of the final grade)

It will consist of the delivery, presentation and defence of the group work done throughout the term.

Minimum grade to average with the rest of the tests: 5

ATTENTION: There is the possibility of taking the evaluation of Test 3 and partially Test 2, before the date of the global assessment test, as students will be informed in the presentation of the subject.

If the final grade is ≥5 but any of the evaluation test grades does not exceed the minimum required, the subject will be failed and the grade on the transcript will be "4.0 fail". If the tests 1, 2 and/or 3 are passed in the first call, but the subject is failed, if the student wishes, the grades corresponding to these tests will be kept for the second call of the same academic year.

The success rate in the subject for the last three years is 43.24% (2020-21), 73.81% (2021-22) and 81.25% (2022-23).

6. Sustainable Development Goals

3 - Good Health & Well-Being
11 - Sustainable Cities and Communities
12 - Responsible Production and Consumption