

Degree	Type	Year
2504604 Environmental Sciences	OB	3

Contact

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Teachers

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Teaching groups languages

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Prerequisites

It is recommended that the course Enginyeria del Medi Ambient has been passed.

It is recommended to take simultaneously Projecte Integrad IV: Tecnologia Ambiental

Objectives and Contextualisation

The main objective of this course is to provide the basic concepts on the management, recovery and treatment of solid waste and treatment of gaseous emissions into the atmosphere from industrial sources.

This general objective includes:

- Prevention in the generation of solid waste, recycling and its integration into the (Bio)Circular Economy.
- Management of urban and industrial waste. Typologies in collection systems. Associated regulatory framework.
- Definition of the scientific and technological bases of solid waste recovery and treatment operations in the urban and industrial sphere: anaerobic digestion, composting, energy recovery, volume reduction, stabilization and solidification treatments, controlled landfill as a final treatment.
- Characteristics of industrial emissions into the atmosphere: typologies and main sectors.
- Definition of the scientific and technological bases of the gaseous emissions treatment operations: elimination of particulate matter operations, gaseous pollutant disposal operations.
- Overview and typologies of an urban solid waste treatment facility: integration of waste and gas treatments.

Learning Outcomes

1. CM33 (Competence) Undertake a general assessment of the social, economic and environmental impact on industrial activities and facilities.
2. CM34 (Competence) Undertake partial environmental projects in the field of technology within a team.
3. CM35 (Competence) Predict, using environmental engineering concepts, the potential environmental impact of new technological solutions or products.
4. KM44 (Knowledge) Recognise the systems, equipment and facilities of environmental engineering and the associated industrial processes.
5. KM45 (Knowledge) Recognise the basic concepts related to the management, recovery and treatment of waste from industrial sources.
6. SM42 (Skill) Assess the analysis and synthesis strategies related to the environmental implications of industrial processes.
7. SM43 (Skill) Extract relevant information from engineering or technological projects related to environmental issues.

Content

Topic 1. Waste prevention and minimisation

Topic 2. Municipal waste

Topic 3. Industrial Waste

Topic 4. Definition of the scientific and technological bases of solid waste recovery and treatment operations in the urban and industrial field: I. Biological treatments

Topic 5. Definition of the scientific and technological bases of solid waste recovery and treatment operations in the urban and industrial field: II. Thermochemical treatments and finalists

Topic 6. Characteristics of industrial emissions from the atmosphere. Scientific and technological bases of gaseous emission treatment operations.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom practices	14	0.56	CM33, CM35, KM44, SM42, SM43
Seminar	6	0.24	CM33, CM34, CM35, SM43
Theory classes	28	1.12	CM34, KM44, KM45, SM43
Type: Autonomous			
Autonomous work	47.5	1.9	CM33, CM34, CM35, SM43
Personal Study	50	2	CM33, CM35, KM44, KM45, SM42

Sessions will be distributed between theory classes, problem classes and classroom seminars.

Theory classes: in these sessions theoretical knowledge will be applied to the resolution of problems and/or practical cases posed by the teaching staff as collected in each teaching unit.

Classroom practices: they will be carried out in coordination with the theory classes. They will include the realization of problems, assessable activities and the development of a case study that will be worked on throughout the semester. The teacher will mark the results to be presented and achieved each week. In these classes, the case study method is also applied, in which the student has to solve illustrative exercises in which they have to apply the concepts developed in the theoretical part.

Seminars: In these sessions, a predetermined topic will be dealt with through the exchange of partial information with the students, the collective analysis of this information and the consequent debate. Seminar attendance is mandatory for carrying out classroom activities.

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.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Classroom assessment activities	10%	0	0	CM33, CM34, CM35, KM44, KM45
Industrial waste case study	15%	1	0.04	KM44, KM45, SM42, SM43
Municipal waste case infographic	15%	0.5	0.02	CM33, CM34, CM35
Theoretical test	60%	3	0.12	CM35, KM44, KM45, SM43

Scheduled evaluation process and activities

The subject consists of the following assessment activities:

- Exams (60%): Two midterm exams will be held throughout the course. Each exam will have a value of 30% of the overall grade. These exams will consist of a theory part combined with some small exercises depending on the units evaluated. Both midterms will be short answer exams and interpretation of cases where students will have to reason the solutions provided or answers.
- Infographic on the case study (15%). This part of the note is not recoverable
- Work/Case study industrial waste (15%). This part of the note is not recoverable
- Assessable activities carried out in class (10%). This part of the note is not recoverable.

The minimum grades to be able to pass the subject are:

- First part: 4
- Second part: 4
- Overall Ratings: 5

Non-participation in any of the evaluation activities will be assessed with a zero. In order to pass the subject, through continuous evaluation it will be necessary to obtain a minimum grade of 5 in the exam (sum of the two partial exams) and a minimum grade of 5 in the overall average of the subject. In the event of not passing this grade, the student may take a retake exam.

Scheduling Assessment Activities

At the beginning of the subject, groups will be formed to carry out the work and the evaluation activities will be scheduled to be carried out during class hours.

The exams will be held according to the schedule set in the Bachelor's Degree exam calendar.

Recovery process

For the recovery process it is exclusively for those students who have not passed the subject from continuous evaluation.

- Midterm exams are eliminatory as long as the grade is equal to or greater than 4.
- The calculation of the final grade, in the recovery process, will be done in the same way as in the continuous evaluation and with the same minimum grade criteria.
- The assessable activities carried out in the classroom are not recoverable.

Qualification review procedure

For each assessment activity, a place, date and time of review will be indicated where students can review the activity with the teaching staff. In this context, complaints may be made about the grade of the activity, which will be evaluated by the teaching staff responsible for the subject. If the students do not take this review, this activity will not be reviewed later.

Ratings

Honors (MH). Granting a grade of honours is the decision of the teaching staff responsible for the subject. UAB regulations indicate that MHs can only be awarded to students who have obtained a final grade equal to or higher than 9.00. Up to 5% of MH of the total number of students enrolled can be awarded.

Students will be considered non-assessable (NA) if they have not taken the first midterm or the retake exam.

Irregularities: copying and plagiarism

Without prejudice to other disciplinary measures deemed appropriate, irregularities committed by students that may lead to a variation in the grade of an assessment act will be graded with zero. Therefore, copying, plagiarism, deception, allowing copying, etc. in any of the evaluation activities will imply failing it with a zero.

Evaluation of repeating students

Students who repeat the subject will not be evaluated differently from the rest of the students.

Single Assessment

Students who have taken the single assessment modality will have to take a final test, where the content of the entire subject will be evaluated. The exam grade must be at least 5.0, and will account for 60% of the grade. On the same day of the exam (which will be held on the same day that the continuous assessment students are evaluated in the 2nd midterm) it will be necessary to submit the work corresponding to the practical cases (previously assigned by the teaching staff), and will have the same weighting explained before for the continuous assessment. The seminars are compulsory with the same assessment as those of continuous assessment. If the final grade does not reach 5.0, the student will have another opportunity to pass the subject through the retake exam that will be held on the same day as the retake exam for the rest of the students.

Bibliography

- Gestión de residuos tóxicos. Tratamiento, eliminación y recuperación de suelos. Michael D. Lagrega, Phillip L. Buckingham, Jeffrey C. Evans. Editorial Mc Graw-Hill. 1996.
- Gestión integral de residuos sólidos. George Tchobanoglous, Hilary Theisen, Samuel A. Vigil. Editorial Mc Graw-Hill. 1994.

- The Practical Handbook of Compost Engineering. R. T. Haug. Editorial CRC Press. 1993. (Disponible document electrònic: <https://ebookcentral.proquest.com/lib/uab/detail.action?docID=5389526>)
- Handbook of Solid Waste Management and Waste Minimization Technologies. Cheremisinoff, Nicholas P. 200. Disponible en línia
- Agència de Residus de Catalunya, www.arc.cat
- Agència Europea del Medi Ambient, <https://www.eea.europa.eu/>

Software

Specific programs are not necessary

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan/Spanish	second semester	morning-mixed
(PAUL) Classroom practices	2	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	1	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	2	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	3	Catalan/Spanish	second semester	morning-mixed
(SEM) Seminars	4	Catalan/Spanish	second semester	morning-mixed
(TE) Theory	1	Catalan/Spanish	second semester	morning-mixed