UAB
Universitat Autònoma de Barcelona

Waste Treatment

Code: 106065
ECTS Credits: 3

2025/2026

Degree	Type	Year
Chemical Engineering	OT	4

Contact

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Teachers

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

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

Objectives and Contextualisation

This subject corresponds to the continuation of the Environmental Technology subject focused on solid organic waste, with a focus on the design and study of facilities with special emphasis on biological treatments (composting, anaerobic digestion, etc.), study of real installations and practical cases.

Knowledge to acquire:

- General knowledge of the different types of solid waste and their associated problems
- List the hierarchy of waste treatment options in order
- Ability to interpret the properties associated with solid waste, especially its biodegradability and ways to measure it.
- Interpret the scientific foundations on which the biological processes of valorization of organic waste from composting and anaerobic digestion are based, and design of facilities
- Learn and compare different thermochemical waste treatment processes.
- Learn about the main waste treatment and recovery facilities
- Know the role of waste in the circular economy and the current trends in its valorisation

Competences

- Communication
- Develop personal work habits.
- Develop thinking habits.
- Show an understanding of the role of chemical engineering in the prevention and resolution of environmental and energy problems, in accordance with the principles of sustainable development.
- Understand and apply the basic principles on which chemical engineering is founded, and more precisely: balances of matter, energy and thermodynamic momentum, phase equilibrium and kinetic chemical equilibrium of the physical processes of matter, energy and momentum transfer, and kinetics of chemical reactions

Learning Outcomes

1. Analyse and evaluate processes in observance of sustainability criteria.
2. Apply chemical engineering to the prevention of environmental and energy problems in accordance with the principles of sustainable development and applied to the different production processes of the main inorganic and organic products in the different sectors of industrial chemistry.
3. Apply environmental and technological risk the evaluation procedures.
4. Apply environmental management systems and tools.
5. Apply matter and energy balance to typical continuous and discontinuous environmental engineering systems.
6. Communicate efficiently, orally and in writing, knowledge, results and skills, both professionally and to non-expert audiences.
7. Develop scientific thinking.
8. Enumerate and describe the social factors involved in environmental solutions.
9. Identify the applicable environmental legislation on a local, regional and global scale.
10. Work autonomously.

Content

Topic 1. Types and characteristics of organic waste
Topic 2. Biological treatments of waste
Topic 3. Thermochemical treatments of waste
Topic 4. Study of waste treatment and recovery facilities.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom practices	5	0.2	5, 4, 2, 6, 7
Theory class	20	0.8	5, 4, 2, 9, 10
Type: Autonomous			
Independent work	21	0.84	1, 5, 2, 6, 7, 9, 10
Personal study	25	1	5, 4, 6, 7, 10

The teaching methodology of this subject combines different elements: lectures and seminars; problem-based learning; cooperative learning; peer assessment; case resolution.

Communication with students will take place via the Virtual Campus (Moodle).

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Assessment activities in classroom	30%	0	0	1, 5, 2, 6, 7, 8, 9
Exams	70%	4	0.16	1, 5, 3, 4, 2, 6, 7, 8, 9, 10

Planned Assessment Process and Activities

The course includes the following assessment activities:

- Exams (70%): Two exams will be held. Exam 1 counts for 30% of the final grade and covers Topics 1 and 2; Exam 2 counts for 40% and covers the entire syllabus. This exam will include both theoretical questions and practical exercises.
- In-class graded activities (30%): This portion of the grade is not recoverable. Tests and graded exercises will be carried out during class sessions.

Failure to participate in any of the assessment activities will result in a grade of zero. To pass the course through continuous assessment, students must score a minimum of 5 in the exam and have an overall average grade of at least 5. If this requirement is not met, the student may take a make-up exam.

Assessment Schedule

At the beginning of the course, the schedule for in-class assessment activities will be announced.

Exams will take place according to the official exam calendar for the degree program.

Make-up Process

The make-up process is only available to students who have not passed the course through continuous assessment.

Exams may be retaken with a synthesis make-up exam.
The final grade in the make-up process will be calculated in the same way and using the same minimum grade criteria as in continuous assessment.
In-class graded activities cannot be recovered.

Grade Review Procedure

For each assessment activity, a time, date, and location will be provided for students to review their work with the instructor. In this context, students may file grade-related complaints, which will be evaluated by the instructor responsible for the course. If a student does not attend the review, the activity will not be reviewed later.

Grading

Honors (MH): Awarding an "Matrícula d'Honor" is at the discretion of the course instructor. According to UAB regulations, MH can only be given to students who achieve a final grade of 9.00 or higher. A maximum of 5% of enrolled students may receive this distinction.

Students will be considered Not Assessable (NA) if they do not attend either the theory exam or the make-up exam.

Irregularities: Cheating and Plagiarism

Without prejudice to other disciplinary actions, any irregularities that could affect the grading of an assessment activity will be marked with a zero. This includes cheating, plagiarism, deception, allowing others to copy, etc., in any evaluation activity.

Assessment of Repeating Students

Students retaking the course will be assessed in the same way as the rest of the class.

Single Assessment

Not applicable.

RESTRICTED USE OF AI

Restricted use: For this course, the use of Artificial Intelligence (AI) technologies is allowed exclusively for tasks involving text correction or improvement, but not for content generation. Students must clearly indicate how they have used these technologies, specify the tools employed, and include a critical reflection on how these influenced both the process and the final outcome of the activity. Lack of transparency in the use of AI in assessable activities will be considered academic dishonesty and may result in partial or total penalties to the activity grade, or more serious sanctions in severe cases.

Bibliography

- 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
- Composting: Fundamentals and recent advances. Sánchez A., Gea T., Font X., Artola A., Barrena R., Moral-Vico J. DOI: 10.1039/9781837673650 RSC Books. 2025.
- Agència de Residus de Catalunya, www.arc.cat
- Agència Europea del Medi Ambient, https://www.eea.europa.eu/

Software

No specific software required

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	211	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	21	Catalan/Spanish	first semester	morning-mixed