COURSE DATA

DATA SUBJECT

Code: 36485
Name: Air pollution control and waste management
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1401 - Degree in Chemical Engineering	Escola Tècnica Superior d'Enginyeria	4	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1401 - Degree in Chemical Engineering	Optional subjects	ELECTIVES

COORDINATION

MARZAL DOMENECH PAULA

SUMMARY

The course ***Air Pollution Control and Waste Management*** is an optional course taught in the Chemical Engineering Degree.

This course consists of 6 ECTS distributed among theoretical and practical classes. In this course, the students will gain the necessary knowledge to design and operate the air pollution control equipment in order to apply them at industrial scale, as well as the engineering aspects related to the waste management and treatment, especially focused on the industrial wastes and on the technologies for treatment and disposal of several industrial sectors.

Observations: The classes will be taught in the language as stated in the course sheet available on the website of the degree.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is recommended to pass previously the next courses in order to affront with guaranties the matter: Environment and sustainability and Environmental pollution engineering.

COMPETENCES / LEARNING OUTCOMES

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Act autonomously in learning, make informed decisions in different contexts, issue judgements based on experimentation and analysis and transfer knowledge to new situations.

Contribute to the design, development and implementation of solutions that respond to social demands, guided by the Sustainable Development Goals.

Demonstrate critical and self-critical thinking, considering professional ethics, moral values and social implications of the different activities carried out throughout the degree.

Propose creative and innovative solutions to complex situations or problems, typical of the area of ¿¿¿¿connection, to donate responses to the various professional and social needs

Recognise and apply the basic principles of the various subjects within this applied and professional field to deepen the learning outcomes already covered in the core subjects.

DESCRIPTION OF CONTENTS

1. Air pollution control

Unit 1. Air pollution dispersion and stack design.
Gaussian model of pollutant dispersion. Stack design.

Unit 2. Treatments for air polluted with particles.
Particle sizing distribution. Terminal settling velocity. Collection equipment design and operation. Guideline to select equipment.

Unit 3. Treatments for air polluted with organic and inorganic compounds.
Treatment equipment design and operation. Guideline to select equipment.

2. Waste management

Unit 4. Hazardous waste characterization.
Hazardous waste: sources and production. Hazardous waste legislation. Identification of hazardous waste.

Unit 5. Waste prevention. Circular Economy. Diagnostic of minimization opportunities. Examples of clean production.

Unit 6. Technologies for valorization and removal of wastes.
Treatment methods with potential of recovery. Physico-chemical treatments. Biological treatments. Thermal treatments. Solidification and stabilization of wastes. Hazardous waste landfills.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Classroom practices	30,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	30,00
Preparation of lessons	25,00
Preparation for assessment activities	15,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

The methodology used in the course will consider the following aspects:

Lecture sessions: the professor will offer a global vision of the course and will focus on the fundamentals and more difficult aspects, besides the resources that will be used throughout the sessions. Some practical applications will be formulated in order to enhance the assimilation of the introduced concepts. These sessions will be taught in a single group.

Practical lessons: some examples and practical applications will be exposed and students will resolve

problems and perform group work and/or oral presentations in order to enhance the assimilation of the concepts introduced. The skills of students in decision-making will be enhanced. There will be practical activities in which the group work under the supervision of the teacher in the resolution proposed activities for groups.

EVALUATION

The assessment of student learning is carried out as follows. Students have two opportunities to pass the course.

First Examination (May-June)

Through the assessment of the continuous assessment activities carried out throughout the semester and the mark of the exam that will take place on the official date. The overall evaluation of the subject will be quantified by a weighted average of two parts, with a relative weight of 30% of the continuous assessment activities and 70% of the exam.

A set of individual and/or group activities during the semester is proposed with an established deadline:

Virtual questionnaires: 10% of the final grade.

Individual and/or group activities: 20% of the final grade.

If the attendance to the classes is less than 70%, the activities of continuous evaluation will be qualified as Not presented. To pass the subject, the exam mark must be equal to or greater than 4.5 and the mark in each of the two parts of the exam (theoretical part and practical part) must be equal to or greater than 4.0. The subject will be considered passed when the weighted average grade is equal to or greater than 5.0. If the minimum required in the exam is not exceeded, the grade of the course will be the lowest grade.

Second Examination (June-July)

By assessing the non-recoverable activities delivered on the date established throughout the semester and the exam mark to be made on the official date. Non-recoverable activities will be specified at the beginning of the course. The overall evaluation of the subject will be quantified by a weighted average of two parts, with a relative weight of 15% of the non-recoverable activities and 85% of the exam.

To pass the course, the exam note must be equal to or greater than 4.5 and the mark in each of the two parts of the exam (theoretical part and practical part) must be equal to or greater than 4.0. The subject will be considered passed when the weighted average grade is equal to or greater than 5.0. If the minimum required in the exam is not exceeded, the grade of the subject will be the lowest grade.

Anyhow, the evaluation system will be based on the guides stated in the *Reglament d'Avaluació i Qualificació de la Universitat de València per a Graus i Màsters* (ACGUV 108/2017).

Copying or plagiarism of any activity that is part of the evaluation will result in the impossibility of passing the course, and the student will then be subject to the appropriate disciplinary procedures indicated in the ACTION PROTOCOL FOR FRAUDULENT PRACTICES AT THE UNIVERSITY OF VALENCIA (ACGUV 123/2020).

REFERENCES

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