VNIVERSITAT DE VALÈNCIA

Course Guide
43810 Control of air pollution

COURSE DATA

DATA SUBJECT

Code: 43810
Name: Control of air pollution
Cycle: Master's Degree
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2250 - Master's Degree in Environmental Engineering	Escola Tècnica Superior d'Enginyeria	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2250 - Master's Degree in Environmental Engineering	Control de la contaminación atmosférica	COMPULSORY

COORDINATION

GABALDON GARCIA M CARMEN

SUMMARY

The subject Air Pollution Control is taught during the 2nd semester of the master's degree in Environmental Engineering. This subject is assigned 6.0 credits that are distributed between theoretical classes and practical classes. This subject aims for the student to acquire the necessary knowledge to address control strategies and the design and operation of air pollution purification equipment for its application at an industrial level. This subject constitutes a training block together with the subjects Waste management and treatment and Management of contaminated soils and sediments.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Previous courses on: Assessment of environmental quality; Transport of pollutants in the environment; Analysis and application of environmental legislation is recommended.

COMPETENCES / LEARNING OUTCOMES

2250 - Master's Degree in Environmental Engineering

Apply environmental engineering designs to produce solutions that meet specific needs addressing public health, safety and welfare taking account of global, cultural, social, environmental and economic factors.

Carry out a comprehensive assessment of environmental air quality.

Characterise emissions to air.

Design, calculate and select engineering solutions to environmental problems, comparing alternatives that include emerging technologies under criteria of technical, social, economic and environmental viability.

Develop environmental solutions under the principles of circular economy and the sustainable development goals.

Identify, formulate and solve complex environmental engineering problems by applying engineering, scientific and mathematical principles.

Implement measures for preventing pollution and recovering, protecting and improving environmental quality.

Interpret and apply national and international environmental legislation and adapt environmental solutions to these regulations.

Learn and apply new knowledge, using appropriate learning strategies.

Manage and operate treatment and/or purification systems in the field of environmental engineering

Recognise the ethical and professional responsibilities of environmental engineering and make informed judgements considering the impact of engineering solutions in global, economic, environmental and social contexts.

Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.

Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

DESCRIPTION OF CONTENTS

1. Pollution prevention and control

Sources. Strategies on air pollution prevention and control. Environmental Regulations. General considerations in process design.

2. Particulate control

Sources of particles. Characteristics of particles. Process design and operation: cyclones, fabric filters, electrostatic precipitators and particulate scrubbers.

3. Control of gases (I)

Sulfur oxides. Nitrogen oxides. Greenhouse gases.

4. Control of gases (II)

Emisión de COVs. Técnicas de prevención: Cambios de producto. Modificación de proceso. Control de fugas. Control de emisiones: incineración, adsorción, condensación y biotratamiento. Fuentes de producción de olores. Eliminación de olores: lavado químico, biofiltración.

5. Specific problematics

Mobile sources. Indoor air quality.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	20,00
Other activities	4,00
Classroom practices	36,00
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	20,00

Preparation of lessons	25,00
Preparation for assessment activities	25,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

Course lessons will cover theoretical and practical lessons (problems, questionnaires and practical cases).

Practical homework will include problems and practical cases.

Mentoring for specific questions will be also available.

EVALUATION

The assessment of student learning is performed by:

Continuous assessment: 30% practical deliverables, 20% questionnaires.

Exam covering theoretical and practical issues: 50%

The subject is passed when the total mark of the evaluation is equal to or greater than 5. The marks obtained in the exam must be equal to or greater than 4.5 out of 10. When the mark of the exam would be equal to or greater than 4.5 out 10, the final mark will be obtained as the maximum between: 1) the average rating of the continuous assessment and the exam and 2) the mark of the exam. When the mark of the exam would be lower than 4.5 out 10, the final mark will be obtained as the maximum between: 1) the average rating of the continuous assessment and the exam and 2) the mark of the exam.

Nevertheless, the assesment will follow the regulations established by the ¿Reglament de Avaluació i Qualificació de la Universitat de València per a títols de Grau i Màster¿ (http://links.uv.es/7S40pjF).

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

- de Nevers, N. Ingeniería de Control de la Contaminación del Aire. McGraw-Hill Interamericana

(1998). Versión traducida de la 1ª edición de Air Pollution Control Engineering, McGraw-Hill.

- Wark K., Warner, C.F. y Davis, W.T. Air Pollution: its Origin and Control. 3ª ed., Addison-Wesley (1998).
- Cooper, C.D, Alley, F.C. Air Pollution Control: A Design Approach. 4º ed, Waveland Press (2011).
- Theodore, L. Air Pollution Control Equipment Calculations. John Wiley & Sons (2008). Texto completo en línea.
- Boubel, R.W., Fox, D.L., Turner, D.B. y Stern, A.C. Fundamentals of Air Pollution. 3ª ed., Academic Press, San Diego (1994).
- Davis, W.T. Air pollution engineering manual. 2º ed., John Wiley & Sons, New York (2000).
- Flagan, R.C. , Seinfled, J.H. Fundamentals of Air Pollution Engineering. 2º ed., Dover Publications (2012). Texto completo en línea.
- Goberna R. Ventilación Industrial: Manual de Recomendaciones Prácticas para la Prevención de Riesgos Profesionales. Generalitat Valenciana (1992).
- McKenna, J.D., Turner, J.H., McKenna Jr, J.P. Fine particle (2.5 microns) emissions: regulations, measurement and control. John Wiley & Sons (2008). Texto completo en línea.
- Niessen, W.R. Combustion and incineration processes. 3ª ed. Marcel Dekker (2002).
- Tata, P., Witherspoon, J, Lue-Hing, C. VOC Emissions from Wastewater Treatment Plants: Characterization, Control and Compliance. CRC Press (2003).
- Vallero, D.A. Fundamentals of Air Pollution. 5ª ed., Elsevier (2014). Texto completo en línea.
- Wang, K.L., Pereira, C., Hung, Y-T Air Pollution Control Engineering. Humana Press (2004).