

COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	University of Oviedo
1.2 Faculty	Faculty of Chemistry
1.3 Department	Chemical and Environmental Engineering
1.4 Field	Environmental Engineering
1.5 Study level	Master
1.6 Specialization	Chemical and Biochemical Process Technology - CBPT

2. Course information

2.1.1 Course name		Advanced Pollution Control Technologies					
2.1.2 Course code		MINQUI01-1-010	2.1.3. Course category			S	
2.2 Course instructor		Laura Faba Peón					
2.3 Course instructors for applied activities (S, L, P, Pr)			Laura Faba Peón				
2.4 Year of study ²	1	2.5 Semester ³	2	2.6 Evaluation type ⁴	E, A	2.7 Course type ⁵	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	2.5	3.2 course	1.3	3.3a sem.	0.5	3.3b laboratory	0.7	3.3c project		3.3.d. practice	
3.4 Total hours from curriculum ⁶	35	3.5 course	18	3.6a sem.	7	3.6b laboratory	10	3.6c project			
Time spent for related activities ⁷										Hours	
Study of recommended books, course support, scientific papers and course notes										35	
Practical skills development										23	
Preparation of seminars / laboratory works / project phases / home works / presentations										25.5	
Evaluation ⁸										3	
Other activities:											
3.7 Total hours of individual study ⁹		86.5									
3.8 Total hours per semestre ¹⁰		121.5									
3.9 Number of credits		4.5									

4. Prerequisites (optional)

4.1 Curriculum ¹¹	
4.2 Learning outcomes	

5. Requirements

5.1 Conditions for course delivery ¹²	Blackboard, video projector
5.2 Seminar / Laboratory / Project delivery requirements ¹³	Blackboard, video projector, computer room, software for the simulation of water treatment plants (GPS-X)

6. Overall objective of the course

The course aims to provide students with knowledge about the best available techniques for treating gas streams, liquid streams and wastes of the main industrial sectors, under the common perspective of prevention and integrated pollution control.

7. Learning outcomes

Knowledge	<p>The student / graduate will:</p> <ol style="list-style-type: none"> 1. Be aware of the currently available technologies for the treatment of gaseous emissions, wastewaters, wastes and polluted soils. 2. Be able to apply the knowledge of effluent treatments to unusual sources of pollution.
Skills	<p>The student / graduate will:</p> <ol style="list-style-type: none"> 3. Have a knowledge and understanding of the design and implementation of new technologies for pollution treatment
Responsibility and autonomy	<p>The student / graduate will:</p> <ol style="list-style-type: none"> 4. Be able to select the best available techniques (BAT) for the treatment of common pollutants

8. Teaching methods

The lectures are devoted to theoretical or practical activities taught by the lecturer and supported by visual material that will be made available to the students in advance. The seminar and laboratory activities are designed to complement the lectures with the analysis and discussion of practical cases (group discussions, assessments, etc.) and visits to industrial facilities.

9. Course content

9. 1. Courses ¹⁵	Teaching methods	Time allocation
9.1.1. Best Available Techniques and Emission Limits.	Interactive lecture. Clarifying explanations. Conferences of professionals in the field.	2 hours
9.1.2. Advanced Treatment of Air Pollution. Treatment of gases from combustion processes: particulate pollution, SO ₂ and NO _x pollution Elimination of dioxins and incomplete combustion products Treatment of gases from low-temperature processes (VOCs) Management and treatment of CO ₂ and other greenhouse gas emissions Treatment of Air Pollution in thermoelectric power generation processes Treatment of Air Pollution in cement manufacturing processes		8 hours
9.1.3. Advanced Treatment of Water Pollution. Waters with oils and hydrocarbons Waters with high nutrient concentrations: biological membrane reactors Waters with inorganic species and metals: chemical and electrochemical processes for metal removal Emerging pollutants: environmental issues and treatment Design, operation, and maintenance of wastewater treatment plants		8 hours
9.1.4. Soil Management and Recovery. Determination of soil pollution Soil decontamination treatment: soil confinement, physical-chemical and biological techniques Integrated management of air, water, and soil pollution.		7 hours
Course bibliography: Best Available Techniques (BAT) reference documents, European Bureau for Research on Industrial Transformation and Emissions (EU-BRITE), https://bureau-industrial-transformation.jrc.ec.europa.eu/reference		
9.2a Seminar	Working methods ¹⁶	Time allocation
Practical cases on analysis, selection and design of the best available techniques for the treatment of a given set of pollutants and process.	Exercises and problem solving. Discuss practical cases.	7 hours

9.2b Laboratory	Working methods ¹⁶	Time allocation
Laboratory experiments and demonstrations. Visits to industrial facilities and pilot plants.	Laboratory experiments and visits to industries.	10 hours
Bibliography for applied activities (seminar / laboratory / project): Same bibliography as courses.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade
10.4 Final Exam	Completeness and correctness of knowledge. Degree of mastery of specialized terminology and communication skills. Ability to apply acquired skills. Ability to process data and solve given problems.	Summative assessment test (final evaluation).	60%
10.5a Seminar 10.5b Laboratory	Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity	Active participation in activities. Assignments.	40%

10.6 Conditions for passing

Grades from 0 to 10 points will be awarded to each activity of the course. The score of the Final Exam must be, at least, 4 points and the score of the Seminar, at least, 5 points.
The Final Evaluation of the module is determined by considering the scores and weights assigned to each activity within the course. A minimum grade of 5 certifies the achievement of the minimal learning outcomes required for the course and the awarding of the corresponding study credits.

Date:

Course instructor: Laura Faba Peón

Course instructors for applied activities: Laura Faba Peón

Date of approval by the department:

Head of Department: Manuel Rendueles de la Vega

Date of approval by the Faculty Council:

Dean: José Javier Borge Álvarez