

## SUBJECT TEACHING GUIDE

### 606 - Environmental Engineering

#### Master's Degree in civil Engineering, Canal and Port Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline	Environmental Engineering				
Course unit title and code	606 - Environmental Engineering				
Number of ECTS credits allocated	4,5	Term	Semester based (1)		
Web	<a href="https://moodle.unican.es/">https://moodle.unican.es/</a>				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE
Name of lecturer	ANA LORENA ESTEBAN GARCIA
E-mail	analorena.esteban@unican.es
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO PROFESOR (2031)
Other lecturers	AMAYA LOBO GARCIA DE CORTAZAR RUBEN DIEZ MONTERO

### 3.1 LEARNING OUTCOMES

- Identify the main atmospheric pollutants, their causes and effects.
- Apply the regulations on air quality or emission control as appropriate.
- Select suitable alternatives to mitigate air pollution situations.
- Identify noise pollution situations, their causes and effects.
- Apply the regulations on noise pollution.
- Select suitable alternatives to mitigate noise pollution situations.
- Describe the problems derived from the different types of solid waste.
- Plan the line of management of urban solid waste of a population.
- Size the elements of the urban solid waste management line.
- Identify and evaluate a contaminated soil.
- Select suitable alternatives for the management of contaminated soil.
- Propose management solutions for a contaminated soil.

### 4. OBJECTIVES

- Offer students tools to identify a problem of air pollution, noise pollution, waste management and soil pollution.
- Provide students with the necessary knowledge to propose solutions to problems of air pollution, noise pollution, waste management and soil pollution.

### 6. COURSE ORGANIZATION

CONTENTS	
1	AIR POLLUTION. Air pollutants, causes and effects. Regulatory framework. Alternatives for the control of atmospheric pollution.
2	NOISE POLLUTION. Causes. Effects. Regulatory framework. Solutions to reduce noise pollution.
3	WASTE MANAGEMENT. Regulatory framework. Waste characterization, classification and evaluation. Specific productions. Street cleaning. Collection and transportation. Physical, chemical and biological treatments. Landfill engineering.
4	CONTAMINATED SOILS MANAGEMENT. Soil pollution. Regulatory framework. Assessment, risk analysis and treatment of contaminated soils.

### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam	Written exam	No	Yes	50,00
Works	Work	No	Yes	35,00
Laboratory and visits	Work	No	No	10,00
Class attendance and participation	Others	No	No	5,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
Only for duly justified causes (eg. health restrictions) the evaluation tests may be organized remotely, with prior authorization from the Center's Management.				
<b>Observations for part-time students</b>				
The part-time student is exempt from class attendance, adding the percentage of the grade assigned to 'attendance and participation' within the one dedicated to 'works'. They must take the written exams. Laboratory practices / visits can be evaluated through work.				

### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

#### BASIC

De Nevers, N. (1998). Ingeniería de control de la Contaminación del Aire. Ed. Mc Graw-Hill. México.

Colomer, F.J. y Gallardo, A. (2007) Tratamiento y gestión de residuos sólidos. Ed. UPV.

Tchobanoglous, G., Theisen, H. y Vigil, S. (1994) Gestión integral de residuos sólidos. Ed. McGraw-Hill.

Tchobanoglous, G. and Kreith, F. (2002) Handbook of solid waste management. 2nd ed. McGraw-Hill.

Jiménez, R. (2017) Introducción a la contaminación de los suelos. Ed. Mundi-Prensa.