

## SUBJECT TEACHING GUIDE

### 578 - Processes, functions and ecosystem services

#### Master's degree in integrated management of water systems

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's degree in integrated management of water systems			Type and Year	Compulsory. Year 1
Faculty	School of civil Engineering				
Discipline					
Course unit title and code	578 - Processes, functions and ecosystem services				
Number of ECTS credits allocated	3	Term	Semester based (1)		
Web					
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	MARIA ARACELI PUENTE TRUEBA				
E-mail	araceli.puente@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 0. DESPACHO MARIA ARACELI PUENTE TRUEBA (0025)				
Other lecturers	JOSE BARQUIN ORTIZ				

3.1 LEARNING OUTCOMES
- Students will know the basic structure and functioning of aquatic ecosystems, especially with regard to the cycles of matter and energy, and their physical, chemical and biological processes
- Students will recognize the differences and similarities in physical, chemical and biological characteristics of the different aquatic ecosystems and will know their spatial and temporal variability
- Students will know the main pressures of aquatic ecosystems and the changes produced in their structure and functioning
- Students will identify and assess the ecosystem services provided by inland, transitional and coastal water systems.

#### 4. OBJECTIVES

The general objective of the course is to give an overview of the most relevant structural and functional aspects of aquatic ecosystems, including changes induced by anthropogenic pressures and their relationship to the goods and services they provide.

#### 6. COURSE ORGANIZATION

CONTENTS	
1	1. Introduction to aquatic ecology
2	2. Functions and processes of inland aquatic systems
3	3. Functions and processes of littoral and marine aquatic systems
4	4. Pressures and impacts on the aquatic environment
5	5. Ecosystem services
6	Final exam

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final exam	Written exam	Yes	Yes	40,00
Practical assignment on theme 5	Work	No	Yes	20,00
Tecnical visit to a riverine aquatic ecosystems.	Activity evaluation with Virtual Media	No	No	10,00
Tecnical visit to estuarine and coastal ecosystems	Activity evaluation with Virtual Media	No	No	10,00
Test themes 1 a 3	Activity evaluation with Virtual Media	No	Yes	20,00
<b>TOTAL</b>				<b>100,00</b>

##### Observations

As accorded by the relevant committees: As a general rule and unless stated otherwise anywhere in this guide, a student cannot request a reexamination if the original grade obtained in the evaluation was not a fail. As a general rule and unless stated otherwise anywhere in this guide, the reexamination activity will take the same form than the original evaluation activity. Grades are measured on a numeric scale going from 0 to 10, where values smaller than 5 are a Fail. Only for sufficiently justified reasons (i.e. sanitary restrictions), the evaluation activities could be organized online, if authorized by the School Director.

##### Observations for part-time students

Part-time students will need to agree with the responsible professor a teaching and evaluation plan to ensure an adequate transfer of knowledge as well as a fair evaluation procedure. The minimum requirement for this students will be to complete a piece of homework and to assist to the final exam of the subject. The weights of each part will be proportional to the weight those parts presents in the general evaluation scheme of the subject.

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

Barnes, R.S.K. & Mann, K.H. 1991. Fundamentals of aquatic ecosystems. Blackwell Scientific Publications. Oxford. 2ª edición.

Dobson, M., Frid CH. 1998. Ecology of aquatic ecosystems. A.W. Longman Ltd. Harlow. UK. 222 pp.

Margalef, R. 1983. Limnología. Omega. Barcelona.

WHO. 2002. Eutrophication and Health. World Health Organization.

Marine Pollution. R.B. Clark. 2001. Fifth edition. Oxford University Press

González del Tánago, M. y García de Jalón, D. 2001. Restauración de Ríos y Riberas. Universidad Politécnica de Madrid.

McLusky, D.S., Elliot, M. 2004. The estuarine ecosystem. Ecology, threats and management. Oxford University Press

Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC.

Frid, C., Dobson, M. 2013. Ecology of Aquatic Management. Oxford University Press

Kareiva, P., Tallis, H., Ricketts, T.H., Daily, G.C., Polasky, S. 2011. Natural Capita: Theory and Practice of Mapping Ecosystem Services. Oxford University Press