

SUBJECT TEACHING GUIDE

M2119 - Biological Tools in Environmental Engineering

Master's Degree in Environmental Engineering and Management

Academic year 2020-2021

1. IDENTIFYING DATA					
Degree	Master's Degree in Environmental Engineering and Management			Type and Year	Optional. Year 1
Faculty	School of civil Engineering				
Discipline	ENVIRONMENTAL QUALITY				
Course unit title and code	M2119 - Biological Tools in Environmental Engineering				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE				
Name of lecturer	XABIER EDUARDO MORENO-VENTAS BRAVO				
E-mail	xabier.moreno@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO (2015)				
Other lecturers	MARIA LUISA PEREZ GARCIA				

3.1 LEARNING OUTCOMES

- Ability to carry out microbiological controls in wastewater treatment plants
- Ability to apply toxicity test protocols.
- Ability to apply bioremediation protocols for contaminated media.
- Ability to investigate the evolution of eutrophication processes.
- Ability to apply bioindicators in the quality of aquatic environments.
- Ability to assess the degree of stress in natural environments.

4. OBJECTIVES

Provide basic knowledge of the principles, methods, techniques and processes of the main instruments applied in environmental engineering.

6. COURSE ORGANIZATION

CONTENTS	
1	Biochemical tools
2	Microbiologic tools
3	Ecological tools applied to Environmental Regulations
4	Group work proposal
5	Laboratory
6	Evaluation

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Theory and problems	Written exam	Yes	Yes	60,00
Written work done in group	Work	No	No	20,00
Laboratory Practices Report	Laboratory evaluation	No	Yes	20,00
TOTAL				100,00
Observations				
It will be necessary to pass the practical and theoretical exam, together with the presentation of the joint work.				
Observations for part-time students				
For part-time students it is also mandatory to attend the laboratory practices, as well as the completion and delivery of the practice report and group work. If you cannot attend the practices, you will be examined together with the written exam, in this case it is not necessary to present the practice report, which will be replaced by the specific mark obtained during the final exam.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Heink, U. & I. Kowarik, 2010. What are indicators? On the definition of indicators in ecology and environmental planning. *Ecological Indicators* 10(3): 447-459
- Jorgensen et al. (Eds) 2005. *Ecological Indicators for Assessment of Ecosystem Health*. CRC press.
- Madigan, M.T., Martinko, J.M.; Dunlap, P.V. y Clark, D.P. *Biología de los microorganismos*. Ed Pearson (2009)
- Rosal, P.; Oliver, J. *Bioquímica: Técnicas y métodos*. Ed Hélice.
- Klaassen CD, Watkins JB. Casarett y Doull. *Fundamentos de Toxicología*. Madrid, McGraw Hill Interamericana, 2005.
- *Principios de Biorrecuperación*. Mc Graw Hill . 1999.
- *Biocnología del medio ambiente: Principios y aplicaciones*- Mc Graw Hill . 2001.

