Information about the subject

Degree: Bachelor of Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 270212 **Name:** Engineering of water treatment systems

Credits: 6,00 **ECTS Year:** The course is not offered this academic year **Semester:** 1

Module: Optional Itinerary: Water Treatment

Subject Matter: Engineering of Water Treatment Systems **Type:** Elective

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught:

Lecturer/-s:

Module organization

Optional Itinerary: Water Treatment

Subject Matter	ECTS	Subject	ECTS	Year/semester
Engineering of Water Treatment Systems	6,00	Engineering of water treatment systems	6,00	This elective is not offered in the academic year 25/26
Characterization of Water Quality	6,00	Characterisation of water quality	6,00	This elective is not offered in the academic year 25/26
Water Treatment Systems	6,00	Water treatment systems	6,00	This elective is not offered in the academic year 25/26

Recommended knowledge

Not contemplated

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1 The student knows the general concepts of purification.

R2 The student knows the technological processes available to purify wastewater: physical processes, chemical processes, biological processes.

R3 The student knows the systems of purification of waters by membranes.

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB2	Students are able to apply knowledge to their work in a professional way and have the competences enabling them to state and defend views and opinions as well as perform problem-solving tasks in their field of study.			x	
CB4	Command of a foreign language			x	
CB5	Students develop the necessary learning skills to undertake further studies with a high level of autonomy.		x		

GENERAL		Weighting			
		1	2	3	4
CG1	Capacity to analyze and synthesize			x	
CG2	Capacity to organize and plan			x	
CG3	Mastering Spanish oral and written communication			x	
CG5	Knowing and applying Basic ITC skills related to marine science		x		
CG6	Capacity to manage information (capacity to look for and analyze information coming from different types of sources)			x	
CG7	Decision making			x	
CG8	Capacity to work in interdisciplinary and multidisciplinary team			x	
CG10	Critical and self-critical capacity			x	

CG11	Capacity to learn			x	
CG12	Capacity to adapt to new situations			x	
CG16	Capacity to apply theoretical knowledge		x		
CG17	Research skills			x	
CG18	Sensibility to environmental issues.			x	

SPECIFIC		Weighting			
		1	2	3	4
CE1	Knowing and understanding contents, principles and theories related to Oceanography			x	
CE2	Knowing basic sampling techniques of water column, organisms, sediment and sea-bottoms as well as basic techniques of dynamic and structural variable measurement		x		
CE4	Understanding laws regulating use of marine resources and environment			x	
CE5	Applying marine environment use planning techniques as well as resource sustainable management			x	
CE6	Applying marine instrument techniques			x	
CE7	Collecting, assessing, processing and interpreting oceanographic data, following the most recent theories			x	
CE8	Identifying and analyzing new problems and proposing solution strategies		x		
CE9	Knowing how to carry out experiments and measurements both in the laboratory and during sample collection			x	
CE10	Knowing how to use planning, designing and implementing research tools while surveying and assessing results			x	
CE11	Knowing how to do fieldwork and laboratory experiments in a safe and responsible way, promoting teamwork			x	
CE15	Identifying and proposing monitoring means for problems of marine pollution		x		

CE19	Deeply understanding operating systems of maritime orientated companies, identifying their problems and proposing solutions		x	
CE22	Practical experience of methods of marine environmental impact assessment		x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3	50,00%	Written test with theoretical and practical questions
R1, R2, R3	40,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
R1, R2, R3	10,00%	Oral presentation

Observations

This course is not eligible for single evaluation. According to the general evaluation and qualification regulations, the preferred evaluation system will be continuous evaluation.
Attendance at practical sessions is mandatory.
The use of artificial intelligence (AI)-based tools is subject to the discretion of the teacher, who may establish specific limits or conditions depending on the training or assessment activity.

MENTION OF DISTINCTION:
In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.

M2 Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.

M3 Activities carried out in spaces with specialized equipment.

M4 Supervised monographic sessions with shared participation.

M5 Application of multidisciplinary knowledge.

M6 Personalized and small group attention. Period of instruction and/or guidance carried out by a tutor to review and discuss materials and topics presented in classes, seminars, readings, papers, etc.

M8 Set of oral and/or written tests used in initial, formative or additive assessment of the student.

M9 Group preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical , practical and/or small-group tutoring sessions. Work done on the university e-learning platform (www.plataforma.ucv.es)

M10 Student's study: Individual preparation of readings, essays, problem-solving, seminars, papers, reports, etc. to be presented or submitted in theoretical, practical and/or small-group tutoring sessions. Work done on the university e-learning platform (www.plataforma.ucv.es).

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
ON-CAMPUS CLASS M1	R1, R2, R3	30,00	1,20
PRACTICAL CLASSES M2	R1, R2, R3	15,00	0,60
LABORATORY M3	R1, R2, R3	5,00	0,20
SEMINAR M4	R1, R2, R3	3,00	0,12
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R2, R3	2,00	0,08
TUTORIAL M6	R1, R2, R3	3,00	0,12
ASSESSMENT M8	R1, R2, R3	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R1, R2, R3	20,00	0,80
INDEPENDENT WORK M10	R1, R2, R3	70,00	2,80
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
CONTENTS	Engineering of water treatment systems. General aspects of debugging. Technological processes available for purifying wastewater: Physical processes, chemical processes, biological processes. Systems of water purification by membranes.

Temporary organization of learning:

Block of content	Number of sessions	Hours
CONTENTS	30,00	60,00

References

1.- J. Virkutyle, R. S. Varma and V. Jegatheesan. Treatment of micropollutants in water and wastewater. IWA Publishing 2010.
2.- F Cervantes, S Pavlostathis, A van Haandel. Advanced biological treatment processes for industrial wastewaters. Principles & applications. IWA Publishing 2006.
3.- Spellman, F. R. Handbook of water and wastewater treatment plant operations. Lewis Publishers 2003.
4.- Metcalf y Eddy, Inc. Ingeniería de aguas residuales. Tratamiento, Vertido y Reutilización, 3ª ed. McGraw-Hill 1995.