



Information about the subject

Degree: Bachelor of Science Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 270220 **Name:** 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: 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 21/22 |
| Characterization of Water Quality | 6,00 | Characterisation of water quality | 6,00 | This elective is not offered in the academic year 21/22 |
| Water Treatment Systems | 6,00 | Water treatment systems | 6,00 | This elective is not offered in the academic year 21/22 |

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 basic concepts of the design of treatment plants.
- R2 The student knows the primary, secondary and tertiary pre-treatment in water treatment systems.



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 | 50,00% | Written test with theoretical and practical questions |
| R1, R2 | 40,00% | Delivery of guided assignments, whose objectives and contents will be proposed by the teacher |
| R1, R2 | 10,00% | Oral presentation |

Observations

MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

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 | 30,00 | 1,20 |
| PRACTICAL CLASSES M2 | R1, R2 | 15,00 | 0,60 |
| LABORATORY M3 | R1, R2 | 5,00 | 0,20 |
| SEMINAR M4 | R1, R2 | 3,00 | 0,12 |
| GROUP PRESENTATION OF ASSIGNMENTS M5 | R1, R2 | 2,00 | 0,08 |
| TUTORIAL M6 | R1, R2 | 3,00 | 0,12 |
| ASSESSMENT M8 | R1, R2 | 2,00 | 0,08 |
| TOTAL | | 60,00 | 2,40 |

LEARNING ACTIVITIES OF AUTONOMOUS WORK

| | LEARNING OUTCOMES | HOURS | ECTS |
|-------------------------|-------------------|--------------|-------------|
| GROUP WORK M9 | R1, R2 | 20,00 | 0,80 |
| INDEPENDENT WORK M10 | R1, R2 | 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 | Water treatment systems. Basic concepts of treatment plant design. Pretreatment. Primary treatment. Secondary treatment. Tertiary treatment. |

Temporary organization of learning:

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

References

- 1.- Espert V., Tratamiento y Calidad del Agua, Instituto Tecnológico del Agua, Madrid, 2004.
- 2.- Romero J.A., Calidad del Agua, Alfaomega (2ª Ed.) , México 1999.
- 3.- A.S.T.M. Manual de Aguas para Usos Industriales, Limusa, México 1991.
- 4.- Spellman F.L., Handbook of Water and Wastewater Treatment Plant Operation ,CRC Press 2009.