Information about the subject

Degree: Bachelor of Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 270211 **Name:** R&D in Marine Sciences

Credits: 6,00 **ECTS Year:** 2, 3, 4 **Semester:** 1

Module: Optional Itinerary: Marine Biology, Optional Itinerary: Marine Biotechnology, Optional Itinerary: Marine Environment Management, Optional Itinerary: Ocean Dynamics, Optional Itinerary: Water Treatment

Subject Matter: R+D in Marine Sciences **Type:** Elective

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

OPM5	Maria Garcia Sanz **(Responsible Lecturer)**	m.garcia@ucv.es

Module organization

Optional Itinerary: Marine Biology

Subject Matter	ECTS	Subject	ECTS	Year/semester
R+D in Marine Sciences	6,00	R&D in Marine Sciences	6,00	2, 3, 4/1
Biology of Cetaceans	6,00	Cetaceans Biology	6,00	2, 3, 4/1
Ichthyology	6,00	Ichthyology	6,00	This elective is not offered in the academic year 23/24
Aquariology	6,00	Aquariology	6,00	This elective is not offered in the academic year 23/24
Bioindicators	6,00	Bioindicators	6,00	2, 3, 4/1
Protected Areas and Recovery of Species	6,00	Protected Areas and Recovery of Species	6,00	2, 3, 4/1
Clinic and Health of Aquatic Animals	6,00	Clinical Treatment and Healthcare of Aquatic Animals	6,00	2, 3, 4/1

Optional Itinerary: Marine Biotechnology

Subject Matter	ECTS	Subject	ECTS	Year/semester
Marine Biotechnology	6,00	Marine Biotechnology	6,00	2, 3, 4/1
Instrumental Techniques	6,00	Instrumental techniques	6,00	This elective is not offered in the academic year 23/24

Sea Food Technology	6,00	Sea Food Technology	6,00	2, 3, 4/1
Genetic Engineering	6,00	Gene Techniques	6,00	This elective is not offered in the academic year 23/24
Food Technology	6,00	Food Technology II	6,00	This elective is not offered in the academic year 23/24
Food Hygiene and Safety	6,00	Food Hygiene and Safety	6,00	This elective is not offered in the academic year 23/24

Optional Itinerary: Marine Environment Management

Subject Matter	ECTS	Subject	ECTS	Year/semester
Marine Environment Geography	6,00	Geography of the marine environment	6,00	This elective is not offered in the academic year 23/24
Marine Engineering	6,00	Maritime Engineering	6,00	This elective is not offered in the academic year 23/24
Evaluation of Environmental Impact	6,00	Assessment of Environmental Impact	6,00	2, 3, 4/1
Natural and Anthropic Risks in the Marine Environment	6,00	Natural and Anthropic Risks in the marine environment	6,00	This elective is not offered in the academic year 23/24
Environmental Education	6,00	Environmental Education	6,00	2, 3, 4/1

Renewable Energies and Marine Mineral Resources	6,00	Renewable energies and marine mineral resources	6,00	This elective is not offered in the academic year 23/24

Optional Itinerary: Ocean Dynamics

Subject Matter	ECTS	Subject	ECTS	Year/semester
Dynamic Physical Oceanography	6,00	Dynamic Physical Oceanography	6,00	This elective is not offered in the academic year 23/24
Paleoceanography	6,00	Paleoceanography	6,00	This elective is not offered in the academic year 23/24
Mathematical Models	6,00	Mathematical Models	6,00	This elective is not offered in the academic year 23/24
Tracers in Oceanography	6,00	Tracers in Marine Sciences	6,00	This elective is not offered in the academic year 23/24
Atmosphere-Ocean Interaction	6,00	Atmosphere-Ocean Interaction	6,00	This elective is not offered in the academic year 23/24

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 23/24
Characterization of Water Quality	6,00	Characterisation of water quality	6,00	This elective is not offered in the academic year 23/24

Water Treatment Systems	6,00	Water treatment systems	6,00	This elective is not offered in the academic year 23/24

Recommended knowledge

No prerequisites

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 is qualified to make a bibliographical revision and is able to analyze it with a critical and constructive spirit.
R2	The student is able to exercise his/her professional activity with an awareness of its impact and social and scientific responsibility.
R3	The student knows the R&D structures, at a local, national and European level, as well as their functioning.
R4	The student has an overview of the main researchers in history and today.
R5	The student is able to document and participate in R&D support instruments (grants, projects, etc.).
R6	The student has an overview of the techniques and methodologies in Marine Sciences.
R7	The student is able to draw up a report and a research paper.
R8	The student knows how to write and read an invention patent.
R9	The student is able to choose a research objective and develop a work plan.

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		
CB3	Students are able to collect and interpret relevant data (generally in their field of study) and give opinions that involve reflection on relevant social, scientific or ethical issues.			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		
CG17	Research skills			x	
CG18	Sensibility to environmental issues.				x

SPECIFIC		Weighting			
		1	2	3	4
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		
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		
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
R2, R3, R4, R5, R6, R7, R8, R9	40,00%	Written test with theoretical and practical questions
R1, R2, R3, R4, R5, R6, R7, R8, R9	40,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
R3, R5, R6, R7, R8	10,00%	Problem-solving and issues related to the use of specific software
R1, R2, R3, R4, R5, R6, R7, R8, R9	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, R3, R4, R6, R8	30,00	1,20
PRACTICAL CLASSES M2	R1, R2, R5, R6, R7, R8	18,00	0,72
SEMINAR M4	R1, R2, R4, R6, R9	3,00	0,12
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R2, R3, R5, R6, R8	4,00	0,16
TUTORIAL M6	R1, R6, R7, R8, R9	3,00	0,12
ASSESSMENT M8	R1, R2, R3, R4, R5, R6, R7, R8, R9	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R1, R3, R5, R7, R8	30,00	1,20
INDEPENDENT WORK M10	R1, R2, R4, R6, R9	60,00	2,40
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
1. Fundamental concepts:	Introduction. Definitions and goals of the investigation. The methods of the technological and scientific research. The characteristics of the current investigation. The nature of the scientific advance.
2. History of marine sciences	Historic events in marine sciences and technologies in Spain. Researchers of maximum importance in marine sciences.
3. The research process:	Phases of an investigation. Planning of an investigation. Research project concept. Structure of a research project.
4. Structure of the marine sciences:	Main R & D Institutions: Universities. Research Institutes. Public agencies of investigation. Science and Technology parks. Large cooperative projects. PR1. Search for centers and companies of R&D in Marine Sciences.
5. Bibliographical Research	Techniques of bibliographical search. Main search engines. Web of Science (WOS). Complementary resources. Journal Citation report (JCR). Research quality index. Bibliometric indicators. Bibliographical quotes. Bibliographic references management. Elaboration of a bibliography. PR2: Main search engines PR3. Use of Web of Science (WOS) PR4. Journal citation report (JCR) and Biblimetric indicators. PR5. Bibliographic references management
6. Scientific production:	Documents types. The scientific article. How to write a research article. Norms of the scientific journals for publication of scientific articles.

7. Resources for the marine sciences.	Scientific politics. Research fellowship
8. Technology transfer:	Management of R & D at the University. Transfer of technology. Patents. PR6. Seminar: Patents

Organization of the practical activities:

	Content	Place	Hours
PR1.	Search for centers and companies of R&D in Marine Sciences.	Computer	4,00
PR2.	Main search engines	Computer	2,00
PR3.	Use of Web of Science (WOS)	Computer	4,00
PR4.	Journal citation report (JCR) and Biblimetric indicators.	Computer	4,00
PR5.	Bibliographic references management	Computer	2,00
PR6.	6. Seminnar "Patents"	Lecture room	2,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
1. Fundamental concepts:	5,00	10,00
2. History of marine sciences	4,00	8,00
3. The research process:	2,00	4,00
4. Structure of the marine sciences:	2,00	4,00
5. Bibliographical Research	7,00	14,00
6. Scientific production:	6,00	12,00
7. Resources for the marine sciences.	2,00	4,00
8. Technology transfer:	2,00	4,00

References

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***Bunge, M., 1985**. La investigación Científica. Su estrategia y su filosofía. Ed. Ariel. Barcelona: 955pp. ISBN: 84-344-8010-7.
***Cegarra-Sanchez, J. 2004.** Metodología de la investigación científica y tecnológica. Ed. Díaz de Santos. Madrid: 355 pp. ISBN: 84-7978-624-8
***De la Lama García, A., 2006.** Estrategias para elaborar investigaciones científicas: los acuerdos sociales y los procesos creativos de la ciencia. Alacalá de Guadaíra: MAD. 117pp. ISBN: 978-84-665-4622-5
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****Pérez-Rubín, J., 2014.** 100 años investigando el mar. El Instituto Español de Oceanografía en su centenario (1914-2014), 500 pp. [ISBN: 978-84-95877-50-5].
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***Sanz Menéndez, L., Cruz Castro, L.,2010.** Análisis sobre ciencia e innovación en España. Fundación Española para la Ciencia y la Tecnología. Madrid: 849pp. ISBN: 978-84-693-6286-0
Saramaki, J., 2018. How to Write a Scientific Paper: An Academic Self-Help Guide for PhD Students. ISBN 10: 173078416X

*Library
** Online

Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

[X] Microsoft Teams

[ ] Kaltura

Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

X	Microsoft Teams
	Kaltura

Explanation about the practical sessions:

Practical sessions, seminar and workshop will be taught online through Microsoft TEAMS

2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

[X] The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

[ ] The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: