Information about the subject

Degree: Bachelor of Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 272004 **Name:** Physiology of Marine Organisms

Credits: 6,00 **ECTS Year:** 2 **Semester:** 2

Module: Transversal Knowledge and Techniques in Marine Sciences

Subject Matter: Organisms and Systems **Type:** Compulsory

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

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Module organization

Transversal Knowledge and Techniques in Marine Sciences

Subject Matter	ECTS	Subject	ECTS	Year/semester
Organisms and Systems	30,00	Marine Botany	6,00	2/2
		Marine Ecology	6,00	3/2
		Marine Microbiology	6,00	2/2
		Marine Zoology	6,00	2/1
		Physiology of Marine Organisms	6,00	2/2
Marine Geology	12,00	Geophysics and Tectonics	6,00	2/1
		Sedimentology	6,00	2/2
Geographic Information Systems and Remote Sensing	6,00	Geographic Information Systems and Remote Sensing	6,00	2/1
Statistics	6,00	Applied Statistics	6,00	2/1

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 and understands with a critical attitude the concepts that are included in the subject of physiology of marine organisms.
R2	The student is able to work in a laboratory performing correctly the basic operations both in the planning and development of each of the laboratory practices.
R3	The student is capable to write an intelligible and well-organized text on different physiological aspects and on the field of marine organisms.
R4	The student seeks bibliographic information from different sources and knows how to analyze it with a critical and constructive spirit.

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
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			
CG13	Capacity to produce new ideas (creativity)				x
CG16	Capacity to apply theoretical knowledge			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			
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	
CE12	Describing, classifying and mapping sea bottoms and coastal areas	x			
CE13	Looking for and assessing different kinds of marine resources	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
	50,00%	Written test with theoretical and practical questions
	20,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
	20,00%	Laboratory test
	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 by means of continuous evaluation. Specifically: There will be a continuous assessment of the theoretical and practical part of the subject. After the theoretical part of each didactic unit, there will be questionnaires in class, test type for the theoretical part, and development for the practical part, imitating the evaluation system of both parts of the final exam of the course, and after the completion, it will be corrected in class so that all students receive feedback on their results.
Attendance at practical sessions is mandatory.
The student must obtain a minimum score of 5 in each of the different evaluation systems in order to obtain a final score of 5 over 10.
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, R3	32,00	1,28
PRACTICAL CLASSES M2, M3, M4, M5	R1, R2	8,00	0,32
LABORATORY M3	R2	10,00	0,40
SEMINAR M4	R1	3,00	0,12
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R3, R4	3,00	0,12
TUTORIAL M6	R1, R2, R3, R4	2,00	0,08
ASSESSMENT M8	R1, R2, R3, R4	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R3, R4	18,00	0,72
INDEPENDENT WORK M10	R1, R2, R3, R4	72,00	2,88
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
UD1. Introduction to physiology.	SUBJECT 1. INTRODUCTION TO PHYSIOLOGY. STRUCTURE-FUNCTION RELATIONSHIP. CONTROL SYSTEMS.SUBJECT 2. HISTOLOGY
UD2. The cell membrane and cell excitability	SUBJECT 1. CELLULAR MEMBRANE AND POTENTIAL ACTION .SUBJECT 2. CELLULAR EXCITABILITY AND ION CHANNELS.
UD3. The nervous system	SUBJECT 1. GENERAL ORGANIZATION. TYPES OF NERVOUS CELLS.SUBJECT 2. CENTRAL NERVISE SYSTEM AND PERIPHERAL NERVOUS SYSTEM. NEURONAL COMMUNICATIONSUBJECT 3. SENSORY SYSTEM.
UD4. Physiology of movement	SUBJECT 1. MUSCLE FIBERS. CONTRACTION AND LOCOMOTION
UD 5. The respiratory system.	SUBJECT 1. BREATH OF MARINE ORGANISMS.SUBJECT 2. BREATHING PULMONATED ORGANISMS.
UD 6. Fluids and circulation.	SUBJECT 1. CARDIO-CIRCULATORY SYSTEMSUBJECT 2. HEMATOPOIESYS AND HEMOSTASY
UD 7. Osmoregulation and excretion.	SUBJECT 1. OSMORREGULATION OF MARINE ORGANISMS.
UD 8. Food, digestion and absorption.	SUBJECT 1. DIGESTIVE ANATOMY.SUBJECT 2. FUNCTIONS.SUBJECT 3. NUTRITIONAL NEEDS IN FISH
UD 9. Endocrine system.	SUBJECT 1. HORMONAL SECRETION AND TRANSPORTATIONSUBJECT 2. MAIN HORMONES AND THEIR REGULATION

UD10. Reproduction and development.	SUBJECT 1. TYPES OF REPRODUCTION. MORPHOLOGY AND REPRODUCTIVE BODIES.SUBJECT 2. FOUNDATION AND DESOVE. GROWTH AND
UD11 PRACTICAL BLOCK	PR1. PR2. PR3. PR.4 PR.5

Organization of the practical activities:

	Content	Place	Hours
PR1.	Dissection, anatomical-physiological analysis and sampling for histology of marine vertebrates.	Laboratory	2,00
PR2.	Dissection, anatomical-physiological analysis and sampling for histology of marine invertebrates.	Laboratory	2,00
PR3.	Establishment of reproductive stage and trophic habits in marine organisms.	Marine station	2,00
PR4.	Hematological parameters in perciforms.	Laboratory	2,00
PR5.	Sensory responses in plantonic organisms.	Laboratory	2,00
PR6.	SOLVED PRACTICAL PROBLEM	Lecture room	4,00
PR7.	GROUP ACTIVITY	Computer	4,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
UD1. Introduction to physiology.	2,00	4,00
UD2. The cell membrane and cell excitability	2,00	4,00
UD3. The nervous system	5,00	10,00
UD4. Physiology of movement	2,00	4,00
UD 5. The respiratory system.	3,00	6,00
UD 6. Fluids and circulation.	2,00	4,00
UD 7. Osmoregulation and excretion.	2,00	4,00
UD 8. Food, digestion and absorption.	2,00	4,00
UD 9. Endocrine system.	3,00	6,00
UD10. Reproduction and development.	2,00	4,00
UD11 PRACTICAL BLOCK	5,00	10,00

References

Anthony P. Farrell. (2015) Encyclopedia of FISH FHYSIOLOGY fron genome to environment. Editorial AP

GUYTON, A.C. (2016). Tratado de fisiología médica. 13º edición interamericana – Mc Graw-Hill.

RANDALL, D. BURGGREN, W. Y FRENCH, K. (2002). Fisiología animal: mecanismos y adaptaciones (Eckert). Interamericana. Mc Graw Hill.

MARTINI, FH. (2001). Fundaments of anatomy and physiology. Prentice May International editions.

HILL, R.W. Y WYSE, G.A. (2006). Fisiología animal. 4º edición. Ediciones Akal.