Information about the subject

Degree: Bachelor of Degree in Marine Sciences

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 270225 **Name:** Ichthyology

Credits: 6,00 **ECTS Year:** 0 **Semester:** 1

Module: Optional Itinerary: Marine Biology

Subject Matter: Ichthyology **Type:** Elective

Department: Oceanography and Environment

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

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	0, 2, 3, 4/1
Biology of Cetaceans	6,00	Cetaceans Biology	6,00	0, 2, 3, 4/1
Ichthyology	6,00	Ichthyology	6,00	0/1
Aquariology	6,00	Aquariology	6,00	0/1
Bioindicators	6,00	Bioindicators	6,00	0, 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	0, 3, 4/1

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 knows the main groups of fish in the marine habitat, especially in the Mediterranean.

R2 The student knows the morphological and biological diversity.

R3 The student knows the geographical distribution, life cycle, feeding, growth and reproduction of fish.

R4 The student applies ecological concepts to fish stocks.

R5 The student knows the structure of the fish communities.

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	
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
CE6	Applying marine instrument techniques			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	
CE13	Looking for and assessing different kinds of marine resources			x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R5	40,00%	Written test with theoretical and practical questions
R1, R2, R3, R4, R5	40,00%	Delivery of guided assignments, whose objectives and contents will be proposed by the teacher
R1, R2, R5	10,00%	Laboratory test
R1, R2, R3, R4, R5	10,00%	Oral presentation

Observations

A minimum of 5 over 10 must have been obtained in each of the different evaluation systems in order to obtain a passing grade.

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, R4, R5	30,00	1,20
PRACTICAL CLASSES M2	R1, R2, R3, R4, R5	10,00	0,40
LABORATORY M3	R1, R2, R3, R4, R5	10,00	0,40
SEMINAR M4	R1, R2, R3, R4, R5	2,00	0,08
GROUP PRESENTATION OF ASSIGNMENTS M5	R1, R2, R3, R4, R5	2,00	0,08
TUTORIAL M6	R1, R2, R3, R4, R5	4,00	0,16
ASSESSMENT M8	R1, R2, R3, R4, R5	2,00	0,08
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK M9	R1, R2, R3, R4, R5	10,00	0,40
INDEPENDENT WORK M10	R1, R2, R3, R4, R5	80,00	3,20
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
UD. 1.- INTRODUCING ICHTHYOLOGY	Item 1. The science of ichthyology. Concept of fish. Diversity of fish. Systematic procedures.
UD. 2. - STRUCTURE AND FUNCTION OF THE FISH.	Item 2. Anatomy of the fish: skeletal structures, skin and scales; Musculature and internal organs. Item 3. Fish physiology and functioning: respiration and metabolism, sensory system, homeostasis, locomotion and feeding. Item 4. Ontogeny and life cycles.
UD. 3. - TAXONOMY, PHILOGENY AND EVOLUTION.	Item 5. Origin and evolution of fish. Item 6. Chondrichthyan fish: characteristics and diversity. Item 7. Teleost fish: characteristics and diversity.
UD. 4.- ZOOGEOGRAPHY AND SPECIAL ADAPTATIONS.	Item 8. Zoogeography: marine and freshwater fish. Item 9. Special habitats and adaptations: great depths, open ocean, polar regions, water limitations, caves, turbulent waters.
UD. 5.- BEHAVIOR AND ECOLOGY.	Item 10. Fish as predators. Item 11. Fish as prey. Item 12. Fish as social animals: reproduction, aggregation, aggression and cooperation. Item 13. Relevance of fish in the functioning of communities and ecosystems.

Organization of the practical activities:

	Content	Place	Hours
PR1.	Morphology and taxonomy of teleost fish	Laboratory	2,00
PR2.	MMorphology and taxonomy of teleost fish	Laboratory	2,00
PR3.	Morphology and taxonomy of teleost fish	Laboratory	2,00
PR4.	Parasitism in fish. Technical visit to aquarium exhibition to observe social behaviors	Technical visit	2,00
PR5.	Morphology and taxonomy of teleost fish	Laboratory	2,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
UD. 1.- INTRODUCING ICHTHYOLOGY	1,00	2,00
UD. 2. - STRUCTURE AND FUNCTION OF THE FISH.	8,00	16,00
UD. 3. - TAXONOMY, PHILOGENY AND EVOLUTION.	3,00	6,00
UD. 4.- ZOOGEOGRAPHY AND SPECIAL ADAPTATIONS.	10,00	20,00
UD. 5.- BEHAVIOR AND ECOLOGY.	8,00	16,00

References

·Bone Q., Moore R. 2008. Biology of fishes. Taylor & Francis.
·Cailliet G.M., Love M.S., Ebeling A.W. Fishes: A Field and Laboratory Manual on Their Structure, Identification and Natural History. Ed. Waveland Press.
·Castro P., Huber M.E. 2007. Biología Marina, McGraw-Hill. Interamericana.
·Hastings P.A.. 2015. Fishes: A Guide to Their Diversity. Univ of California Press.
·Helfman G., Collette B.B., Facey D.E., Bowen B.W. The Diversity of Fishes: Biology, Evolution, and Ecology. Ed. WILEY-BLACKWELL.
·Kapoor, B.G., Bhavna K. 2004. Ichthyology Handbook. Ed. Springer.
·Long J.A. The Rise of Fishes : 500 Million Years of Evolution. JOHNS HOPKINS UNIVERSITY PRESS.
·Mijail Pérez, Antonio. 2015.BiogeografíaAplicada.Amazon Fulfilment. Poland.
·Moyle P.B., Cech J.J. Jr. Fishes: An Introduction to Ichthyology. Prentice Hall.