



## IDENTIFYING DATA

### Biology of Exploited and Potentially Exploitable Species

Subject	Biology of Exploited and Potentially Exploitable Species			
Code	V02M098V01207			
Study programme	Máster Universitario en Biología Marina			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	1st	2nd
Teaching language	Spanish			
Department				
Coordinator	García Estévez, José Manuel Cremades Ugarte, Javier			
Lecturers	Besteiro Rodríguez, Celia Cremades Ugarte, Javier Fernández Rodríguez, José Luis García Estévez, José Manuel			
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Web				
General description	(*)Ciclo vital e dinámica de poboacións das especies actualmente explotadas no litoral galego, e de especies potencialmente *explotables. Hábitat, abundancia, distribución e propiedades *nutritivas			

## Training and Learning Results

Code	
A4	(*)Que os estudantes saiban comunicar as súas conclusións, e os coñecementos e razóns últimas que as sustentan, a públicos especializados e non especializados dun xeito claro e sen ambigüidades.
A5	(*)Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun xeito que terá que ser, en grande medida, autodirixido e autónomo.
B2	Búsqueda, análise e integración de información a partir de diferentes fontes e capacidade para su interpretación y evaluación
B5	Desarrollo de la habilidad de elaboración, presentación y defensa de trabajos e informes técnicos
C2	Conocimiento de la diversidad de organismos marinos y sus estrategias adaptativas
C3	Conocimiento y comprensión de las interacciones de los organismos marinos y los ecosistemas marinos y costeros
C4	Conocimiento y búsqueda del potencial interés económico y biotecnológico de los organismos marinos
C5	Conocimiento de los principios de explotación y sostenibilidad del medio marino y planificación y supervisión de su gestión
C9	Conocimientos de instituciones, organismos y legislación relacionados con el medio marino y sus recursos empresariales y económicos
C10	Inspección y asesoramiento técnico en la evaluación, explotación y gestión de pesquerías, extracción de recursos e instalaciones de acuicultura
D1	Desarrollo de las capacidades comprensivas, de análisis y síntesis
D2	Desarrollo de la capacidad de razonamiento crítico y autocrítico
D4	Desarrollo de la capacidad para actualizar el conocimiento de forma autónoma
D7	Desarrollo de habilidades para la divulgación de ideas en contextos tanto académicos como no especializados
D8	Desarrollo de la habilidad para hablar bien en público

## Expected results from this subject

Expected results from this subject	Training and Learning Results
(*)	C5

(*)	B2 C2 C3 C4
(*)	C2 C3
(*)	C2 C3 C5
(*)	C4
New	C5 C9 C10 D4
New	A4 A5 B2 B5 D1 D2 D4 D7 D8

## Contents

Topic	
Seaweeds as marine resources.	Life cycles and biological types. Uses of seaweeds: alginophytes, agarophytes, carrageenophytes, ulvanophytes and edible seaweeds. Ecological value and ecosystem services of marine macroalgae. Study methodologies of its biology, distribution, and abundance. Main species of seaweeds of economic interest from the peninsular Atlantic coasts. Good practices and indicators of sustainability of the exploitation and cultivation of commercial seaweeds.
Marine invertebrates as marine resources.	Main species of benthic marine invertebrates that are currently exploited in Galicia. Life cycle and population dynamics. Habitat, abundance, and geographic distribution. Species associated with rocky bottoms: mussel seed, oysters, barnacles, and sea urchins. Species associated with soft substrates: cockles, clams, razor clams, and other bivalve molluscs. Other exploited or potentially exploitable species.
Pelagic, demersal and bottom species	Initially, a short introduction is made on the main oceanographic characteristics of the pelagic environment, in general, and of the coast of Galicia and the Cantabrian Sea in particular, to understand the main interactions of the species under study with their environment. Subsequently, the study of the life cycle and the essential biological aspects involved in the dynamics of the exploited populations of the main pelagic and demersal species of fish and crustaceans in Galicia and the Cantabrian coast are addressed. The study focuses on albacore tuna ( <i>Thunnus alalunga</i> ) as a model species of the oceanic pelagic environment, and mackerel ( <i>Scomber scombrus</i> ) within the coastal pelagic environment. Regarding bottom species, the hake ( <i>Merluccius merluccius</i> ) and the spider crab ( <i>Maja brachydactyla</i> ) are studied. Habitat and adaptations. Generalities and guide species. Typical examples: anchovies and sardines; bonito and swordfish. Potentiality of exploitable species (discards).

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	24	58.8	82.8
Presentation	4	16	20
Seminars	4	0	4
Mentored work	12	30	42
Objective questions exam	1	0	1
Essay questions exam	1	0	1

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Lecturing	Presentation by the teacher of the contents on the subject matter of study, theoretical bases and / or guidelines of a work or exercise that the student has to develop.
Presentation	Presentation by the students to the teacher and / or a group of students of a subject matter or content of the results of a job, exercise, project ... It can be done individually or in groups.
Seminars	Personalization of support and follow-up of the student.
Mentored work	Para desenvolver a capacidade de buscar e estruturar unha información traballando de forma autónoma e de expor publicamente os resultados obtidos.

### Personalized assistance

#### Methodologies Description

Presentation	Students will be attended personally via face-to-face in the classroom or through virtual platforms (Teams, Virtual classrooms, etc.).
Seminars	Discussion of the individual/group work presented

### Assessment

	Description	Qualification	Training and Learning Results			
Presentation	The work done and delivered as well as the clarity and synthesis capacity in its public exposure will be evaluated	30	A4 A5	B2 B5	C9	D1 D2 D4 D7 D8
Mentored work	Both the attendance and attitude in the lectures will be evaluated.	10				D1 D2
Objective questions exam	The written test will consist of a series of objective multiple choice questions that cover all parts of the subject.	20	A5	B2	C2 C9	D2
Essay questions exam	The written exam will consist of a series of development questions of medium length and covering all parts of the subject	40	A5	B2	C2 C4 C5 C9 C10	D1 D4

### Other comments on the Evaluation

#### Sources of information

##### Basic Bibliography

- Bocanegra, A., Bastida, S., Benedí, J., Ródenas, S. & F.J. Sánchez-Muníz, **Characteristics and nutritional and cardiovascular-health properties of seaweeds**, 2009
- Chambers, R.C. & E.A. Trippel, **Early life history and recruitment in fish populations**, Chapman & Hall, London, 1997
- Critchley, A.T. & Ohno, M. & Largo, D.B. (Eds.), **World Seaweed Resources**, ETI. University of Amsterdam. (CD-ROM, 2006
- Dawes, C.J., **Marine Botany**, John Wiley & Sons, Inc., New York, 1997
- Doumenc, D. A. & Van Praet, **Ordre des Actiniales. Ordre des Phychodactiniales. Ordre des Corallimorphaires**, In Grassé, P.P. (Ed.), *Traite de Zoologie*.Vol. III, Masson, Paris, 1987
- Figueras, A. J., **Biología y cultivo del mejillón (Mytilus galloprovincialis) en Galicia**, Biblioteca de Ciencias, Consejo Superior de Investigaciones Científicas, M, 2007
- Gerking, S.D., **Feeding ecology of fish**, Academic Press, San Diego, 1994
- Graham, L.E., & L.W. Wilcox, **Algae**, Second edition, Pearson, 2009
- Guiry, M.D. & Blunden, G., **Seaweeds Resources in Europe: Uses and Potential**, John Wiley & Sons, West Sussex, 1991
- Helfman, G.S., B.B. Collette & D.F. Facey, **The diversity of fishes**, Blackwell Science, USA, 1997
- Hurd, C.L., Harrison, P.J., Bischof, K. & Lobban, C.S., **Seaweed Ecology and Physiology**, Cambridge University Press, 2014
- Little, C. & J.A. Kitching, **The Biology of Rocky Shores**, Oxford University Press, 1996
- Lüning, K., **Seaweeds their environment, biogeography and ecophysiology**, John Wiley & Sons, Inc. Toronto, 1990
- Molares, J., **Estudio del ciclo biológico del percebe (Pollicipes cornucopia Leach) de las costas de Galicia**, 1993
- Nielsen, S. Suzanne, **Análisis de los alimentos**, Editorial Acribia, S.A., 2003
- Pereira, L., **Edible Seaweeds of the World**, CRC Press, Boca Raton, FL, USA., 2016
- Sirkoski, Z.E., **Seafood: Resources, Nutritional Composition and Preservation**, CRC Press, Inc., 1990
- Vincent, A., Stanley, A. & Ring, I., **Hidden champion of the ocean: Seaweed as a growth engine for a sustainable European future**, <https://www.seaweedeurope.com>, 2020
- Weatherley, A.H. & H.S. Hill, **The biology of fish growth**, Academic Press, London, 1987

### **Complementary Bibliography**

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Barnes, M., **Pedunculate cirripedes of the genus Pollicipes**, 1996

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Bell, M., F. Redant & I. Tuck, **Lobsters: biology, management, aquaculture and fisheries**, Bruce Phillips (ed.). Blackwell Publishing, 2006

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Cruz, T., **Biología e ecología do percebe, Pollicipes pollicipes (Gmelin, 1790) no litoral sudoeste portugués**, Universidad de Évora, 2000

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Lustres Pérez, V., **El erizo de mar: Paracentrotus lividus (Lamarck, 1816) en las costas de Galicia**, Universidad de Santiago de Compostela, 2006

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Manuel, R. L., **British Anthozoa (Coelenterata: Octocorallia & Hexacorallia)**, Synopses of the British Fauna (New Series)., 18 (R, 1988

---

Sakaguchi, M. (Ed.), **Developments in food science. More efficient utilization of fish and fisheries products**, Elsevier, 2004

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Xunta de Galicia, **Plan de ordenación de los recursos pesqueros y marisqueros de Galicia (III). Las algas en Galicia alimentación y otros usos**, Santiago de Compostela, 1993

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### **Recommendations**

#### **Subjects that continue the syllabus**

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Evaluation and Exploitation of Coastal Resources/V02M098V01208

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#### **Subjects that it is recommended to have taken before**

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Marine Botany/V02M098V01102

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Marine Zoology/V02M098V01103

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