



## IDENTIFYING DATA

### Marine Zoology

Subject	Marine Zoology			
Code	V02M098V01103			
Study programme	Máster Universitario en Biología Marina			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Mandatory	1st	1st
Teaching language	Spanish Galician			
Department				
Coordinator	García Estévez, José Manuel Besteiro Rodríguez, Celia			
Lecturers	Besteiro Rodríguez, Celia García Estévez, José Manuel			
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Web				
General description	In this matter expose : - The models of organisation of the main groups of marine animals - The morphological diversity and the adaptations to the different habitats, ways of life, feeding and reproduction. - The systematic of the main groups. - The fauna of the *sustratos rocky and **sedimentarios of the coastal and deep systems.			

## Training and Learning Results

Code	
A1	(*)Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, adoito nun contexto de investigación.
A2	(*)Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo.
A3	(*)Que os estudantes sexan capaces de integrar coñecementos e se enfrontar á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos.
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.
B1	Utilización de criterios y métodos científicos en el planteamiento y resolución de problemas aplicando los conocimientos adquiridos
B6	Desarrollo de la curiosidad científica, de la iniciativa y la creatividad
C2	Conocimiento de la diversidad de organismos marinos y sus estrategias adaptativas
C14	Elaboración, discusión, interpretación, asesoramiento y peritaje de informes científico-técnicos, éticos, legales y socioeconómicos relacionados con el ámbito marino y pesquero
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

## Expected results from this subject

Expected results from this subject	Training and Learning Results
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*Knowledge of wool *diversity of marine *organisms *and *his *adaptative *strategies	A1 A2 B1 D1 D2
New	A1 A2 B1 C2 D1 D2
New	A1 A2 B1 C2 D1 D2
New	A1 A2 B1 C2 D1 D2
New	A1 A2 B1 C2 D1 D2
New	A1 A2 A3 A4 A5 B1 B6 C2 C14 D1 D2 D4 D7

## Contents

Topic	
Architectural patterns of the animals.	The form and the corporal design like adaptation to the means <b>**bentónico</b> and <b>**pelámico</b> . Colonial forms and <b>**gregarias</b> . The skeletal <b>*structures</b> . The movements. Systems of defence. <b>**Coloracións</b> . Shelters and territoriality. Interspecific <b>*relations</b> . The feeding. The asexual <b>*reproduction</b> .
<b>**Poríferos</b>	The <b>*individualisation</b> . The <b>*sustrato</b> and the <b>**hidrodinamismo</b> like <b>*determinantes</b> of the corporal form. The skeletal <b>*trainings</b> . The leak like way of life. Evolution of the types of organisation second the internal circuit of water. Asexual <b>*and</b> sexual reproduction.
<b>*Metazoan **diblasticos</b>	<b>**Cnidarios</b> . You form them <b>*polyp</b> and <b>*jellyfish</b> . Exclusive cells: the <b>**cnidocitos</b> . Classification.- <b>**Hidrozoos</b> . Individual and colonial forms. Colonies <b>**hidroides **pelámicas</b> . <b>**Hidromedusas</b> . Colonies <b>**pelámicas</b> mixed. Special structures for the <b>*flotation</b> , the trip and the capture of the food.- <b>**Cubozoos</b> .- <b>**Escifozoos</b> . Structure. The <b>*swimming</b> by <b>**pulsacións **natatorias</b> .- <b>**Antozoos</b> . Structure. Solitary forms, colonial and <b>**pseudocoloniales</b> . Colonies <b>corneas</b> . The coral reefs.- <b>**Ctenóforos</b> .
<b>*Metazoan **triblasticos</b>	<b>**Turbelarios</b> . <b>**Gnatostomúlidos</b> . <b>**Gastrotricos</b> . <b>**Quinorrincos</b> <b>*Nematodes</b> . <b>**Nemertinos</b> . <b>**Priapúlidos</b> . <b>**Caracteres Singular</b> . Ways of life. Ecology.

Molluscs	Mantle, cavity **paleal and *radula.- **Solenogastros. **Caudofoveados. **Monoplacóforos. **Poliplacóforos. **Carácteres Singular. Ways of life. Ecology.- *Gasteropods. The ventilation **paleal. The *solidez of the *gusanillo *asymmetric. The reduction of the shell in the **Opisthobranchios. *Locomotion, *swimming and *flotation. Feeding. The put.-Bivalve. The shell. The mantle. The *ornamentación. The feeding. The **sifóns and the welding of the mantle. Mechanisms of burial, fixation and **retropropulsión. Bivalve **epifáunicos, **perforadores and **xilófagos.- **Escafópodos. **Carácteres Singular. Ways of life. Ecology.- Cephalopods. The shell. The *swimming. The capture of the preys. The courtship and the posture.
*Annelids **Poliquetos	The corporal model generalised. The *locomotion **parapodial. The *elytrons. The movements *excavadores. **Poliquetos **tubícolas, **perforadores, **intersticiais and **simbiontes. The **depredación. **Sedimentívoros No **seletivos and **seletivos superficial and **subsuperficiais. The leak.
**Sipuncúlidos. **Equiúridos	**Carácteres Singular. Ways of life. Ecology.
Crustaceans	Generalities: the corporal regionalisation and the appendix **birrámico.- **Remipedios, **Cefalocáridos, **Maxilópodos. **Carácteres Singular. Ways of life. Ecology.- **Malacostráceos: **Filocáridos And **Eumalacostráceos. The *swimming **pleopodal and the fan discharge. Forms **reptantes: caves and shelters. Territoriality. **Decápodos **Braquiuros And **Anomuros: adaptative *diversity.
**Lofoforados	**Briozoos. Colonies **estoloniais, **incrustantes, **arbusculares and **foliáceas. Colonies **estenolaemadas, **ctenostomadas and **quilostomadas. **Avicularias And **vibracularias. The colonial growth. The *protrusion of the **lofóforo. The feeding.- Quotation of **Foronídeos, **Braquiópodos and **Ectoproctos.**Quetognatos. **Carácteres Singular. Ways of life. Ecology.
*Echinoderms	The *shell **dermatoesquelético, the *symmetry and the orientation.- **Asteroídeos. The system **ambulacral. The burial. The carnivorous *feeding.- **Ofiuroídeos. The *locomotion **braquial. The burial. The feeding.- **Equinoídeos. The *shell: regular and irregular hedgehogs. The feeding **raspadora: the *torch of **Aristóteles. The *excavation. The feeding **sedimentívora: spines and podiums.- **Holoturoídeos. The corporal orientation: **bivio and *trivium. The different ways of life: buccal podiums. The feeding **suspensívora, **detritívora and **sedimentívora. The *tubules of **Cuvier.- Quotation of **Crinoídeos.- **Hemicordados. **Tunicados. **Carácteres Singular. Ways of life. Ecology.
**Cefalocordados. Vertebrates	The **esqueleto *axial: **notocorda and vertebral column.- **Condriictios. *Swimming by waves of **contracción. The stability, direction and control of the *swimming. The predatory feeding.- **Osteíctios. The *swimming. Alimentary diets. The feeding *rapaz and **planctívora. Social behaviour. Cares **parentais.- Mammalian *Cetáceos. Modifications of the plan of organisation **mammaliano for the aquatic life. Adaptation to the variations of hydrostatic *pressure: **narcose and *decompression. The feeding **planctívora (**Mistacocetos). The carnivorous *feeding (**Odontocetos). The **ecolocación. Communication and social behaviour.

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	12.5	37.5	50
Mentored work	4	8	12
Presentation	2	6	8
Seminars	2	0	2
Essay questions exam	3	0	3

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

## Methodologies

	Description
Lecturing	Kinds *presenciais stop the exhibition by part of the Professor of the contained of the *temario of theory.
Mentored work	Practices varied (*pizarra, problems, computer) in the that employ tools *manipulativas own of the subject.
Presentation	Presentation and debate of the contained and of the resulted of works developed pole student.

Seminars \*Tutorías Customized. Resolution to the students of doubts envelope the theoretical content of the subject.

### Personalized assistance

#### Methodologies Description

Seminars	Resolution to the students of doubts envelope the theoretical content of the subject
Presentation	It helps @perante orientation of the @docente to the correct design of the exhibitions, the *dicción and the defence of the works *expositivos.

### Assessment

	Description	Qualification	Training and Learning Results			
Lecturing	Continuous evaluation of the assistance and attitude of the students in the lecture sessions	10	A1 A2 A3 A4 A5	B1	C14	D1 D2
Mentored work	Evaluation of the knowledge purchased by means of the elaboration in group of one work related with the program of the subject. The relation of works will be proposed by the professor.	25				D1 D2
Presentation	Continuous evaluation of the knowledge purchased by means of the public presentation of the work previously mentioned	15	A4 A5			D2 D4 D7
Essay questions exam	Evaluation of the knowledge purchased by means of the realization of an written exam related to the subject program	50	A1 A2 A3 A4 A5	B1 B6	C2 C14	D1 D2 D4 D7

### Other comments on the Evaluation

In the first opportunity we take the four methodologies. In the second one, the avaluación will be realized by means of a written exam, keeping the qualifications obtained during the course for the continuous avaluación.

For the students that do not developed the activities of continuous avaluación (class attendance and elaboration and presentation of the homework), the written proof will suppose the 100% of the rating.

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

- Barnes, R.D., **Zoología de los invertebrados.**, 1989,
- Barnes, R.S.K., Callow, P., Olive, P.J.W., Golding, D.w. & Spicer, J.J., **The invertebrates: a synthesis.**, 2001,
- Brusca, R.C. & Brusca, G.J., **Invertebrates**, 2002,
- Castro, P. & M.E. Huber., **Biología marina.**, 2007,
- Cognetti, G., Sará, M. & G. Magazzú., **Biología marina.**, 2001,
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- Moutou, F., **Los mamíferos en su medio.**, 1993,
- Varios Autores., **Galicia. Natureza. Zooloxía. Tomo XXXVII: Zooloxía I; Tomo XXXVIII: Zooloxía II; Tomo XXXIX: Zooloxía III; Tomo XL: Zooloxía IV.**, 2002,
- Ruppert, E.E. & Barnes, R.D., **Zoología de los invertebrados.**, 1996,
- Young, J.Z., **La vida de los vertebrados.**, 1985,
- Hondt, J.L.d', **Les invertebrés marins méconnus**, 1999,
- Bayer, F.M. & H.B. Owre, **The free-living lower Invertebrates.**, 1968,
- Campbell, A.C., **Guía de campo de la flora y fauna de las costas de España y de Europa.**, 1983,
- Fretter, V. & A. Graham., **A functional anatomy of Invertebrates.**, 1976,
- Gardiner, M.S., **Biología de los Invertebrados**, 1978,
- Hayward, P.J. & J.S. Ryland., **Handbook of the Marine Fauna of North-West Europe.**, 1975,
- Hayward, P.J. & J.S. Ryland., **The Marine Fauna of the British Isles and North-West Europe, vol 1: Introduction and Protozoans to Arthropods**, 1990a,

Hayward, P.J. & J.S. Ryland., **The Marine Fauna of the British Isles and North-West Europe, vol 2: Molluscs to Chordates.**, 1990b,

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Hayward, P.J., T. Nelson-Smith & C. Shields, **Guía de identificación de la flora y fauna de las costas de España y Europa.**, 1998,

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Kaestner, A., **Invertebrate Zoology, vol III.**, 1970,

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Kaestner, A., **Invertebrate Zoology, vol I.**, 1967,

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### **Recommendations**

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

Sampling Techniques for Identification of Marine Organisms and Communities/V02M098V01201

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#### **Subjects that are recommended to be taken simultaneously**

Marine Botany/V02M098V01102

The Marine Environment: Physical Oceanography/V02M098V01101

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#### **Other comments**

It recommends update the knowledges of Zoology purchased in the degree or the degree.

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