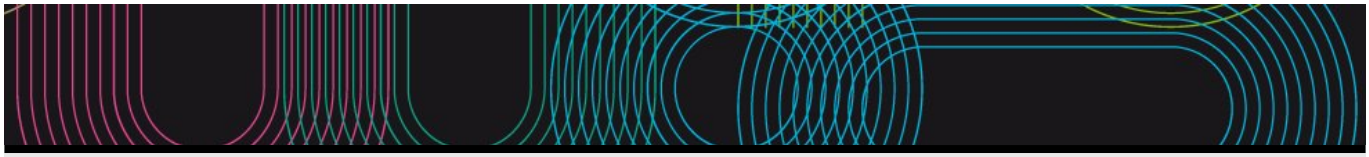

IDENTIFYING DATA				
Marine Botany				
Subject	Marine Botany			
Code	V02M098V01102			
Study programme	Máster Universitario en Biología Marina			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Mandatory	1st	1st
Teaching language	Spanish			
Department				
Coordinator	García Estévez, José Manuel Peña Freire, Viviana			
Lecturers	García Estévez, José Manuel López Rodríguez, María del Carmen Peña Freire, Viviana			
E-mail	jestevez@uvigo.es vpena@udc.es			
Web				
General description	(*)Estudio de los principales organismos (fitoplancton y fitobentos) que se desarrollan en el medio marino, así como de los factores que condicionan su distribución.			

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
B2	Búsqueda, análisis e integración de información a partir de diferentes fuentes y capacidad para su interpretación y evaluación
B6	Desarrollo de la curiosidad científica, de la iniciativa y la creatividad
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
C7	Catalogación, evaluación, conservación, restauración y gestión de áreas marinas y litorales protegidos. Elaboración, asesoramiento legal y ejecución de planes de ordenación del litoral
D1	Desarrollo de las capacidades comprensivas, de análisis y síntesis
D4	Desarrollo de la capacidad para actualizar el conocimiento de forma autónoma
D5	Desarrollo de las habilidades de comunicación y discusión de planteamientos y resultados

Expected results from this subject	
Expected results from this subject	Training and Learning Results

New	A1 A3 A4 B6 D1
New	B1 C2 C3 C7
New	A2 C7 D1 D5
New	A5 B2 D4

Contents	
Topic	
Generalities	Unit 1. Marine habitat. Introduction and general characters. Influential environmental factors in the photosynthetic organisms: light, temperature, substrata, hydrodinamism, tides, salinity, pH, nutrients and polution. Interactions between organisms: predation, simbiosis, epibiosis, endobiosis, parasitism. Unit 2. Phytoplankton. General characters, importance, floristic groups and populational dynamics. Unit 3. Phytobenthos. General characteristics of their communities. Classification of bentic organisms according to sustrata. Unit 4. Phytobenthos. Ecophysiology. Adaptations to the habitat conditions . Morphological diversity, life histories, biological types and vital forms.
Diversity	Unit 5. Descriptive and systematics of red seaweeds (Rhodophyta): main groups and characteristic species. Unit 6. Descriptive and systematics of Brown seaweeds (Ochrophyta): main groups and characteristic species. Unit 7. Descriptive and systematics of green seaweeds (Chlorophyta): main groups and characteristic species. Unit 8. Descriptive and systematics of other benthic organisms: Cyanophyta, seagrass, fungi and lichens: main groups and characteristic species.
Ecology and biogeography	Unit 9. Ecology of the phytobenthos. Distribution of the marine organisms: vertical or zonation, temporal sucession and spatia or biogeographic . Diagrams of zonation of the littoral and nomenclature. Unit 10. Biogeography. Definition, methodology and indexes. Factors in the distribution of the marine vegetation: temperature and latitude. Unit 11. Marine vegetation in the Atlantic North and Mediterranean. Unit 12. Marine vegetation of the Iberian Peninsula and of Galicia. Exposed coasts, semiexposed and protected sites. Diversity, descriptive and zonation.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	12	18	30
Seminars	8	24	32
Seminars	2	2	4
Mentored work	0	9	9

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

Methodologies	
	Description
Lecturing	FACE-TO-FACE CLASSES FOR EXHIBITION, BY PART OF THE PROFESSOR, OF THE CONTENTS OF THE MATTER And THE DEVELOPMENT OF THE *TEMARIO, EXPLANATION OF CONCEPTS And APPROACH OF THE SEMINARS.
Seminars	AUTONOMOUS WORK OF THE STUDENT FOR THE STUDY And ASSIMILATION OF THEORETICAL And PRACTICAL CONCEPTS, AS WELL AS FOR THE RESEARCH OF INFORMATION And BIBLIOGRAPHY FOR THE REALISATION OF THE WORKS RELATED WITH THE SEMINARS.
Seminars	You INTERVIEW WITH THE *PROFESORADO FOR THE ADVICE And DEVELOPMENT OF THE ACTIVITIES OF THE MATTER IN THE PROCESS OF THE LEARNING.
Mentored work	WORKS/DOCUMENTS/INFORMATION ELABORATED BY THE STUDENT, OF AUTONOMOUS WAY, FOR THE DEVELOPMENT OF THE SEMINARS. ALWAYS, UNDER THE GUIDELINES OF THE PROFESSOR IN WHAT it CONCERNS To THEMATIC, QUESTIONS To DEVELOP And USES OF SOURCES OF INFORMATION.

Personalized assistance	
Methodologies	**Description**
Seminars	It will attend to the students personally via face-to-face in the classroom, by telematic systems and by email, as well as in the office (Monday to Weednesday (4 to 6 p.m.).

Assessment						
	Description	Qualification	Training and Learning Results			
Lecturing	Evaluation by means of an objective proof written that will include ask type test, definitions, short questions and subjects to develop.	70	A2 A3 A4	B1 B2	C2 C3 C7	D1 D5
Seminars	Evaluation of the attitude and the degree of participation (asks/answer) by part of the student in each one of the seminars.	20	A1 A2 A3 A5	B1 B2 B6	C7	D4
Mentored work	Evaluation of the content and quality of the work realised by the student in the thematic of the seminars.	10	A2 A4	B6		D1 D5

Other comments on the Evaluation

A minimum mark of 4 out of 10 in the written test (exam) is required.
For cases of fraudulent performance of exercises or tests, the provisions of the Regulations on the assessment of students' academic performance and the review of grades shall apply.

Sources of information

Basic Bibliography

Complementary Bibliography

Lobban, C.S. & P.J. Harrison, **Seaweed ecology and physiology**, 1994
Graham, L. E., J. M Graham & L. W. Wilcox, **Algae**, 2009
Dawes, C.J., **Marine Botany**, 1997
Lüning, K., **Seaweeds their environment, biogeography and ecophysiology**, 1990
Reviers, B de, **Biologie et phylogénie des algues, tome 1, 2**, 2002, 2003
Hoek, C. van den, D.G. Mann, H.M. Jahns, **Algae: An Introduction to phycology**, 1995
Guiry & Guiry, **http://www.algaebase.org/**, continuo
Green, E.P. & F.T. Short, **World Atlas of Seagrasses**, 2003
Guillén, JE., Ruiz, JM, Otero, M, Díaz-Almela, E., **Atlas de las praderas marinas de España**, 2015
Hurd, C.L., P.J. Harrison, K. Bischof & C.S. Lomman, **Seaweed Ecology and Physiology**, Cambridge, 2014
AlgaeTraits: a trait database for (European) seaweeds, **https://algaetraits.org/**, continuo
Guía online algas de Asturias, **http://www.asturnatura.com/**,
Algas marinas bentónicas Mediterráneo y Atlántico, **http://manuel.gonzales.free.fr/#gsc.tab=0**,
Useful Marine Plants of the Asia-Pacific Region Countries, **http://www.imb.dvo.ru/misc/algae/index.php/en/intro2**,

Recommendations

Subjects that continue the syllabus

Biology of Exploited and Potentially Exploitable Species/V02M098V01207
Invasive Species and Fouling/V02M098V01211
Sampling Techniques for Identification of Marine Organisms and Communities/V02M098V01201

Subjects that are recommended to be taken simultaneously

Marine Ecology/V02M098V01105
Physiology of Marine Organisms/V02M098V01106
Marine Zoology/V02M098V01103

Other comments

To know general aspect of Botany and Phycology (diversity, systematics, reproduction, life histories).