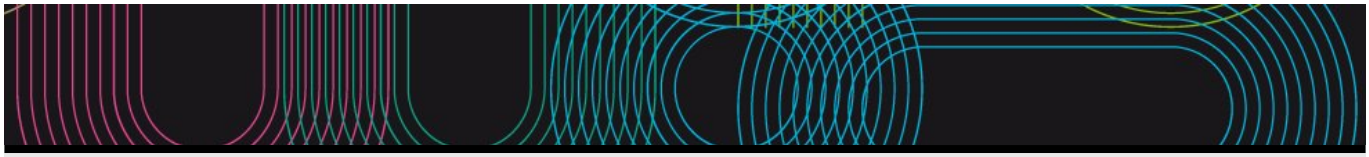

IDENTIFYING DATA				
Biological Oceanography				
Subject	Biological Oceanography			
Code	V10M153V01CF103			
Study programme	Máster Universitario en Oceanografía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	1st
Teaching language	#EnglishFriendly Spanish			
Department				
Coordinator	Teira Gonzalez, Eva Maria			
Lecturers	Lasa Gonzalez, Aide Martínez García, Sandra Teira Gonzalez, Eva Maria			
E-mail	teira@uvigo.es			
Web	http://masteroceanografia.com/			
General description	The subject tackles the study of communities, food webs and the main oceanographic processes that take place in the ocean. We will present basic notions on the cycle of the organic matter in the marine environment. We will do special emphasis on microbial plankton communities, as they play a predominant role in marine biogeochemical cycles. The fundamental aim is to acquire basic knowledge on the communities of organisms, their interactions and the oceanographic processes in order to understand the role of the biology of the ocean in the Earth system functioning.			

Training and Learning Results	
Code	
A1	Students who have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context
A5	Students who have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.
B1	The students will understand in a detailed and based form the theoretical and practical aspects and the work methodology of the oceanography
D1	The students will know and will be able to apply the scientific method in the academic and research fields.
D2	The students will possess the handle skills in the laboratory that allow them to develop autonomous work.

Expected results from this subject	
Expected results from this subject	Training and Learning Results
Students will be able to use the terminology and concepts related with the biological oceanography scientific field	A1 B1
Students will be able to apply the scientific methodology and the basic technics related with the biological oceanography research field	A1 A5 B1 D1 D2
Students will be able to analyse and explain the relationship between the organisms and the environmental factors	A1 B1
Students will recognize the diversity and function of the main planktonic and benthonic marine groups	A1 B1
Students will be able to comprehensively describe the processes of circulation of the organic matter in the marine environment	A1 B1
Students will be able to evaluate, formulate, and resolve problems related with the oceanography	B1 D1
Students will be able to demonstrate advanced oral and written communication skills	D1

Contents	
Topic	
Lesson 1. The marine environment.	Classification of marine environments and organisms. Abiotic conditions: solar radiation, temperature, salinity, density, pressure. Oceanic circulation.
Lesson 2. Phytoplankton and primary production.	Main groups of phytoplankton. Photosynthesis and primary production. Factors that control primary production. Spatial and temporal variability.
Lesson 3. Microbial plankton: decomposition of organic matter.	Bacteria, archea, virus and heterotrophic protists. Biomass, production and bacterial growth efficiency. Factors that control the bacterial growth: resources versus predation.
Lesson 4. Zooplankton and pelagic food webs.	Main groups of zooplankton. Transfer of energy and trophic chains. Types of pelagic food webs.
Lesson 5. Benthonic Organisms.	Main groups of benthonic plants and animals. Factors that determine the structure of benthonic communities.
Lesson 6. Benthonic communities.	Benthonic communities of shallow rocky and sandy environments. Benthonic communities of deep systems.
Lesson 7. Human impact on the marine environment.	Overexploitation. Invasive species. Destruction and alteration of habitats. Climate change.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	18	30	48
Studies excursion	5	4	9
Laboratory practical	4	7	11
Presentation	2	4	6
Seminars	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	In-person presentation of subject contents supported with graphic material.
Studies excursion	Application of methodologies for field sampling in biological oceanography. Attendance is compulsory.
Laboratory practical	Study of the effect of nutrients on the microbial plankton metabolic rates. Attendance is compulsory.
Presentation	Oral presentation of the results obtained by the students in the field and laboratory practices.
Seminars	Analysis of the results obtained in the laboratory.

Personalized assistance	
Methodologies	**Description**
Lecturing	Doubts about theoretical and practical contents will be resolved trough on-line or in-person tutorials.
Studies excursion	Doubts about theoretical and practical contents will be resolved trough on-line or in-person tutorials.
Laboratory practical	Doubts about theoretical and practical contents will be resolved trough on-line or in-person tutorials.
Presentation	Doubts about theoretical and practical contents will be resolved trough on-line or in-person tutorials.
Seminars	

Assessment					
	Description	Qualification	Training and Learning Results		
Lecturing	Contents will be evaluated trough a written exam.	40	A1 A5	B1	
Studies excursion	Field work will be evaluated trough attendance and participation. Attendance is compulsory.	10	A1	B1	
Laboratory practical	Contents will be evaluated trough a written exam. Attendance is compulsory.	20		B1	D1 D2
Presentation	Oral presentation about the practical lab work. The quality of the presentation as well as the clarity of the exposition and the capacity to communicate of the student will be specifically valued.	30	A5		D1

Other comments on the Evaluation

The oficial dates of evaluation tests will be available at: http://masteroceanografia.com/horarios/

All tests can be evaluated on the second chance exam. Nonattendance to studies excursion and laboratory practical precludes the possibility to be evaluated in the second chance exam.

Sources of information

Basic Bibliography

Lalli CM, **Biological oceanography. An introduction**, Elsevier,

Miller, CB, **Biological oceanography**, Wiley-Blackwell,

Complementary Bibliography

Kaiser, MJ, **Marine ecology. Processes, systems, and impacts**, Oxford University press, New York,

Kirchman DL, **Microbial ecology of the oceans**, Wiley-Liss, New York,

Reynolds C, **Ecology of Phytoplankton**, Cambridge University,

Castellani, C & Edwards, M, **Marine Plankton**, OxfordOxfrod University press, New York,

Recommendations

Subjects that continue the syllabus

Biogeochemistry of Coastal Systems/V10M153V01211
Global Change and Marine Ecosystems/V10M153V01208
Coastal Ecosystems/V10M153V01212
Oceanography of Unique Regions: Polar, Equatorial and Upwelling Regions/V10M153V01204

Subjects that are recommended to be taken simultaneously

Design and Carrying out of Oceanographic Campaigns/V10M153V01301
Oceanography of Ecosystems/V10M153V01102

Other comments

Students willing so could attend personal tutorials to solve doubts and/or uncertainties. To better optimise the procedure, the student is requested to previously contact his/her teacher with reasonable anticipation.

Students are strongly requested to fulfil a honest and responsible behaviour. It is considered completely unacceptable any alteration or fraud (i.e., copy or plagiarism) contributing to modify the level of knowledge and abilities acquired in exams, evaluations, reports or any kind of teacher□s proposed work. Fraudulent behaviour may cause failing the course for a whole academic year. An internal dossier of these activities will be built and, when reoffending, the university rectorate will be asked to open a disciplinary record