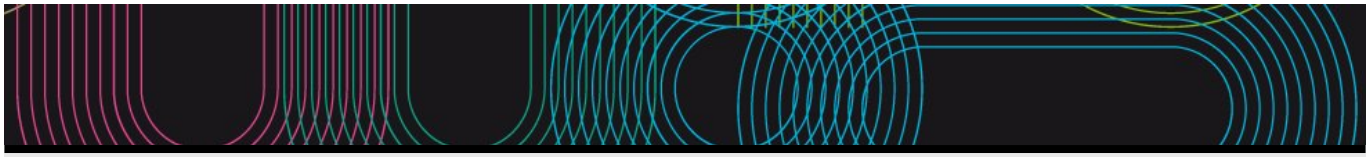

IDENTIFYING DATA				
Oceanography of Ecosystems				
Subject	Oceanography of Ecosystems			
Code	V10M153V01102			
Study programme	Máster Universitario en Oceanografía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Mouriño Carballido, Beatriz			
Lecturers	Marañón Sainz, Emilio Mouriño Carballido, Beatriz			
E-mail	bmourino@uvigo.es			
Web	http://masteroceanografia.com/			
General description	This course addresses the trophic organisation and ecological functioning of pelagic communities, paying special attention to physical-biological coupling at different scales. Control factors of primary production and the role of the pelagic ecosystem in global biogeochemical cycles are studied. The course includes local oceanography case studies of the NW Iberian peninsula.			

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
B1	The students will understand in a detailed and based form the theoretical and practical aspects and the work methodology of the oceanography
B3	The students will be able to deepen in the main oceanographic processes and their spatiotemporal scales
B4	The students will be able to analyse oceanographic databases and obtain skills for their treatment.
C1	The students will be able to obtain advanced and relevant knowledge, of skilled and multidisciplinary character, in the field of the oceanography and their application to the marine environment
C3	The students will analyse situations and specific oceanographic conditions related with the global change
D1	The students will know and will be able to apply the scientific method in the academic and research fields.
D3	The students will be able to communicate the obtained information and their conclusions in a effective way to the general public, to other scientists and to the competent authorities, listening and answering of effective form and, using an appropriate language to the audience and to the context

Expected results from this subject	
Expected results from this subject	Training and Learning Results
Interpretation of distribution patterns of planktonic organisms as well as fundamental biological processes.	A1 B3 C1 C3
Familiarise with advanced methodological tools for the study of pelagic ecosystems	B1 B4 D1
Understanding the way in which different key processes (physical, chemical and biological) interact in the ocean, using exhaustive analysis of regional cases	C1 C3 D3

Contents

Topic	
Introduction	Pelagic ecosystems and their interactions with hydrodynamics. Key functional groups in the plankton. Production and fate of organic matter.
Physical-biological coupling in pelagic ecosystems	Scales of variability in the interaction between physical and biological processes: mixing and stratification, internal waves, frontal systems, sub- and meso-scale structures.
Plankton size structure: ecological and biogeochemical implications	Size-dependence of phytoplankton abundance, biomass and metabolism. Plankton size spectra. Environmental and ecological control of size structure.
Trophic analysis of pelagic ecosystems	Pelagic food webs. Bacteria-phytoplankton coupling. Grazing and mixotrophy. Structure of planktonic communities and biogeochemical circulation.
The role of pelagic ecosystems in global biogeochemical cycles.	Controlling factors of primary production. Processes and patterns of ocean nutrient limitation. The spring bloom: underlying mechanisms. The biological pump and the global carbon cycle.
Regional oceanography: the upwelling system of NW Iberian peninsula	Ecological and biogeochemical impact of the Galician upwelling. Links between size structure and metabolic balance in Ría de Vigo. Irradiance and nutrients as controlling factors of phytoplankton growth. Responses of microbial plankton to global change processes.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	20	10	30
Seminars	8	7	15
Seminars	17	13	30
Mentored work	0	30	30
Presentation	5	15	20

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

Methodologies

	Description
Lecturing	Fundamental theoretical contents are explained, supported by visual material and key review articles.
Seminars	Using data from articles and/or databases, theoretical concepts are applied quantitatively, so that a deep understanding of the topics can be obtained (E. Marañón).
Seminars	Using data from articles and/or databases, theoretical concepts are applied quantitatively, so that a deep understanding of the topics can be obtained (B. Mouriño).
Mentored work	The students prepare a group project that consists in a bibliographic review. The students work under the supervision of the professor. The oral presentation of the work is followed by a debate session.
Presentation	Oral presentation of mentored work

Personalized assistance

Methodologies	Description
Lecturing	The students are supervised by the instructor during the preparation of the seminar. Tutorial hours are also used to solve any difficulties related to the acquisition of knowledge and skills.
Mentored work	The students are supervised by the instructor during the preparation of the seminar. Tutorial hours are also used to solve any difficulties related to the acquisition of knowledge and skills.
Presentation	The students are supervised by the instructor during the preparation of the seminar. Tutorial hours are also used to solve any difficulties related to the acquisition of knowledge and skills.

Assessment

	Description	Qualification	Training and Learning Results
Seminars	Evaluation of the understanding of the different concepts and processes treated during the theoretical classes and the seminars (E. Marañón). The proof consists of short questions.	17	A1 B1 C1 B3 C3
Seminars	Evaluation of the understanding of the different concepts and processes treated during the theoretical classes and the seminars (B. Mouriño). The proof consists of short questions.	33	

Mentored work	Evaluation of the written presentation. It values the rigour in the understanding of the concepts used, and the utilisation of diverse bibliographic sources.	20	A1	B1 B3 B4	C1	D1 D3
Presentation	Evaluation of the oral presentation. It values the rigour in the understanding of the concepts used, the utilisation of diverse bibliographic sources, and the clarity and precision during the oral presentation.	30				

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.

Sources of information

Basic Bibliography

Kirchman DL (Ed.) (2008), **Microbial Ecology of the Oceans**, 2a,

Williams RG, Follows MJ (2011), **Ocean dynamics and the carbon cycle: principles and mechanisms**, 1a,

Complementary Bibliography

Fasham MJR (2003), **Ocean biogeochemistry**, 1a,

Mann KH, Lazier JRN (2006), **Dynamics of marine ecosystems: biological-physical interactions in the oceans**, 3a,

Miller CB (2012), **Biological oceanography**, 2a,

Simpson JH, Sharples J (2012), **Introduction to the Physical and Biological Oceanography of Shelf Seas**, 1a,

Steele JH, Turekian KK, Thorpe SA (2008), **Encyclopedia of Ocean Sciences**, 2a (online),

Recommendations

Subjects that continue the syllabus

Global Change and Marine Ecosystems/V10M153V01208

Subjects that it is recommended to have taken before

Biological Oceanography/V10M153V01CF103

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