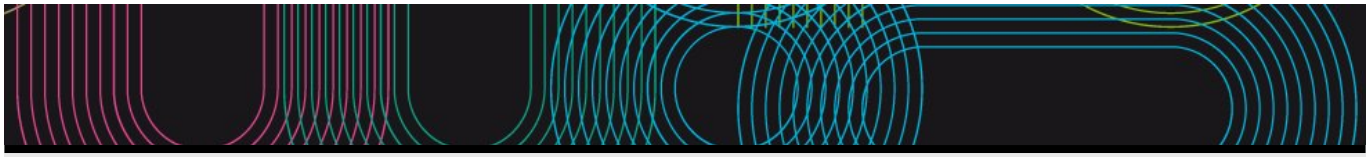

IDENTIFYING DATA				
Oceanography of Ecosystems				
Subject	Oceanography of Ecosystems			
Code	V10M153V01102			
Study programme	(*)Máster Universitario en Oceanografía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Marañón Sainz, Emilio			
Lecturers	Fernández Suárez, Emilio Manuel Marañón Sainz, Emilio Mouriño Carballido, Beatriz			
E-mail	em@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.			

Competencies	
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

Learning outcomes	
Expected results from this subject	Training and Learning Results
Interpretation of the patterns of distribution of organisms of the plankton 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 of 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. Structure of planktonic communities and biogeochemical circulation. Use of stable isotopes to study food webs.
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
Master Session	16	8	24
Seminars	14	7	21
Tutored works	0	39	39
Presentations / exhibitions	4	0	4
Case studies / analysis of situations	14	21	35
Short answer tests	2	0	2
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies

	Description
Master Session	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.
Tutored works	Students prepare, under the instructor's supervision, a seminar that consists in an analysis of data combined with a bibliographic review. The seminar is present orally and is followed by a session of debate.
Presentations / exhibitions	Oral presentation of seminars.
Case studies / analysis of situations	Students carry out several analyses of oceanographic data using methods and computer tools that are common biological oceanography research.

Personalized attention

Methodologies	Description
Tutored works	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
Master Session	Participation during classes and especially in the sessions of discussion of articles, as well as in the discussion after seminar presentation	10	D3
Tutored works	Evaluation of the seminar's oral presentation. The following points are taken into consideration: rigour in data analysis, understanding and command of the concepts used, use of diverse bibliographic sources, and clarity and precision during the presentation and discussion.	60	A1 B1 C1 D1 B3 D3 B4
Short answer tests	Short questions, test questions and practical cases are proposed, so as to evaluate the ability to apply the concepts discussed in the classes.	30	A1 B1 C1 B3 C3

Other comments on the Evaluation

Sources of information

Fasham MJR (2003), **Ocean biogeochemistry**, 1a,
Kirchman DL (Ed.) (2008), **Microbial Ecology of the Oceans**, 2a,
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),
Williams RG, Follows MJ (2011), **Ocean dynamics and the carbon cycle: principles and mechanisms**, 1a,

Recommendations

Subjects that continue the syllabus

Global Change and Marine Ecosystems/V10M153V01208

Subjects that it is recommended to have taken before

Biological Oceanography/V10M153V01CF103