



## IDENTIFYING DATA

### Biological oceanography I

Subject	Biological oceanography I			
Code	V10G061V01301			
Study programme	Grado en Ciencias del Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Lastra Valdor, Mariano			
Lecturers	Aranguren Gassis, María Costas Selas, Cecilia Delgadillo Nuño, Erick Jabalera Cabrerizo, Marco Justel Díez, Maider Lastra Valdor, Mariano Tascón Peña, Osvaldo			
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General description	This subject insight in the study of a number of coastal ecosystems, located in the sea-land interface, from a ecological approach. This includes beaches, rocky shore, saltmarshes, estuaries, seagrass, coastal lagoons, dunes, reefs and mangroves. The fundamental aim will be to understand the ecosystem functions, to analyze faunal assemblages and to describe the human impact that these environments face in an scenario of global change.			

## Skills

Code	
A3	Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues
A4	Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
B2	Plan and execute surveys in the field and laboratory work, applying basic tools and techniques for sampling, data acquisition and analysis in the water column, sea bottom and marine substratum.
B3	Recognize and implement good practices in measurement and experimentation, and work responsibly and safely both in field surveys and in the laboratory.
B4	Manage, process and interpret the data and information obtained both in the field and in the laboratory.
B5	Develop, implement and write basic or applied projects in oceanography from a multidisciplinary perspective.
C1	know at a general level the fundamental principles of sciences: Mathematics, Physics, Chemistry, Biology and Geology.
C9	Acquire basic knowledge about the structural and functional organization and the evolution of marine organisms.
C10	Know the biological diversity and functioning of marine ecosystems.
C11	Apply the knowledge and techniques acquired to the characterization and sustainable use of living resources and marine ecosystems.
D2	Acquire the ability to learn autonomously, continuously and collaboratively, organizing and planning tasks over time.
D3	Understanding the meaning and application of the gender perspective in different fields of knowledge and in professional practice with the aim of achieving a more just and equal society.
D5	Sustainability and environmental commitment. Equitable, responsible and efficient use of resources.

## Learning outcomes

Expected results from this subject	Training and Learning Results
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Through theoretical contents, practical, exits of field and the work of investigation, at the end of the course the student will have to have purchased the necessary knowledges that allow him interpret the operation of the coastal ecosystems (estuaries, beaches, coastal lagoons, etc), and his interaction with the antropic activities in the open ocean.

A3	B2	C1	D2
A4	B3	C9	D3
A5	B4	C10	D5
	B5	C11	

## Contents

Topic	
1. Introduction to the marine habitat	1.1. Types of coastal habitats 1.2. Adequacy of the coastal ecosystems to the typology of habitats of interest 1.3. Conservation of the coastal ecosystems 1.4 Destruction of the coastal habitats
2. Estuaries	2.1. Introduction 2.2. Salinity and substrate 2.3. Vegetation and macrofauna 2.4. The communities of Petersen 2.5. The alimentary chain
3. Rocks	3.1. General appearances 3.2 Adaptations to the physical stress: temperature, waves, burial, .. 3.3. Coasts warmed up, exposed and moderately exposed. 3.4. Subtidal rocks 3.5. Control factors 3.6. The food chain
4. Beaches	4.1. Introduction 4.2. Types of Beaches 4.3. Zonation 4.4. Flora and fauna
5. Coastal lagoons	5.1. General characteristics 5.2. Lagoon organisms 5.3. Ecology of the coastal lagoons 5.4. Primary and secondary production
6. Dune systems	6.1. General characteristics 6.2. Characteristics of ecological importance 6.3. Dune vegetation 6.4. Fauna 6.5. Food chains
7. Mangroves	7.1. Distribution and physical conditions 7.2. Zonation 7.3. Ecological importance
8. Coral reefs	8.1. The paper of the zooxanthellae 8.2. Factors that limit the growth of the reefs 8.3. Geographic distribution and types of coral reefs 8.4. Productivity of the reef 8.5. Biological interactions and mutualism
9. Vertical structure in open ocean and coastal waters: biology of the superficial ocean.	9.1 Zonation of the oceanic region 9.2. Phytoplankton and zooplankton 9.3. Food webs

## Planning

	Class hours	Hours outside the classroom	Total hours
Seminars	7	7	14
Laboratory practical	15	0	15
Studies excursion	0	10	10
Lecturing	25	37.5	62.5
Mentored work	0	34.5	34.5
Objective questions exam	1	10	11
Essay	1	2	3

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

## Methodologies

Description

Seminars	They will divide the groups in subgroups of 4-5 people. Each subgroup will prepare a work to choose between the subjects offered by the professor at the beginning of the course. Each student will have to involve clearly in all or some of the facets of the work. The works will be directed during the destined hours to the seminars. The oral exhibition will have a length of 20 minutes for the oral presentation and 5 minutes for the round of questions of the professor and of the rest of students. The presentation will come accompanied by an archive in computer support (powerpoint) that will send to the professor in dates fixed previously to the presentation.
Laboratory practical	With the samples taken during the exit to the sea, the students will learn to realise separation, identification and headcounts of pertaining organisms to distinct groups of the bentos. With the table of data obtained will work the statistical section from univariate analysis, bivariate and multivariate.
Studies excursion	They will realise in the subject two field trips: 1) Exit to the estuary of Vigo in the fuselage Mytilus, for the collected of benthic samples with dragas quantitative (Van-Veen).  2) Exit to Aguiño (Ribeira, A Coruña)
Lecturing	They will present and they will argue theoretical contents that they will be evaluated in a final examination.
Mentored work	The works of investigation will be driving in group through the seminars. The students that belong to the same group will have to assist to same group of seminar.

### Personalized assistance

Methodologies	Description
Lecturing	Theoretical classes on the subjects of the subject. Its content will be moved to the platform TEMA once that each subject has finalised. Students willing so could attend personal tutorials to solve doubts and/or uncertainties, which will mainly take place during the timetables indicated. To better optimise the procedure, the student is requested to previously contact his/her teacher with reasonable anticipation. Schedule of tutorials: September 2017: Tuesday and Thursday of 17:00 to 18:00 h. From October 2017: Tuesday and Thursday of 13:00 to 14:00 h.
Laboratory practical	2 groups of laboratory of 20 students roughly.
Seminars	3 groups of seminars, of roughly 15 students, and that will serve to give support to the works of investigation developed by the students.

### Assessment

	Description	Qualification	Training and Learning Results
Seminars	The groups will be divided into subgroups of 4-5 people. Each group will prepare a work to choose from among those proposed by the teacher at the beginning of the course. The works will be tutored during the hours allocated to the seminars (small groups 2.5 h). The presentation of the works will take place in December and will last 20 minutes for the oral presentation and 5 minutes for the round of questions from the teacher and the rest of the students. The presentation will be accompanied by a file on computer support (powerpoint) as well as a document in PDF that will be sent to the teacher on dates set before the presentation.	25	A3 B2 C1 D2 A4 B3 C9 D3 A5 B4 C10 D5 B5 C11
Laboratory practical	Participation in practices, rigor in sampling and laboratory work, aptitude for teamwork and the ability to prepare and interpret results will be evaluated.	10	A3 B2 C1 A4 B3 C9 A5 B4 C10 B5 C11
Lecturing	Written exam. Questions will be asked that show the level of understanding acquired by the students throughout the subject, both in the theoretical classes, as well as in the practical ones, seminars and field trips.	65	A3 B2 C1 D2 A4 B3 C9 D3 A5 B4 C10 D5 B5 C11

### Other comments on the Evaluation

To surpass the subject is necessary to approve each one of the three proofs (test, seminars and practicals).

In the second announcement only will realise an examination written corresponding to the matter given in the test, but will take into account the assistance to seminars and practical during the course.

Date, time and place of exams will be published in the official web of Marine Sciences

Faculty: <http://mar.uvigo.es/alumnado/examenes/>

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.

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## Sources of information

### Basic Bibliography

Moore P.G. & R. Seed, **The ecology of Rocky coast**, First Edition, Columbia University Press, 1986

Keninich Michael J., **Coastal Lagoons: Critical habitats of Environmental Change**, First Edition, CRC Press Taylor and Francis Group, 2010

Hogarth Peter J., **The Biology of Mangroves**, First Edition, Oxford University Press, 1999

Kjerfve B., **Coastal Lagoon processes**, First Edition, Elsevier science B.V., 1994

Sorokin Y. I., **Coral Reef Ecology**, Springer, 1995

Barnes R.S.K., **An introduction to marine ecology**, Second edition, Blackwell Science, 1999

Nordstrom, K.F., Psuty, N. & Carter, B., **Coastal dunes**, Wiley & sons, 1990

Nybakken, James W., **Marine biology : an ecological approach**, Fourth edition, Pearson Benjamin Cummings, 2005

Brown, A.C. & McLachlan, **Ecology of sandy shores**, Elsevier, 1990

### Complementary Bibliography

Knox G.A., **The ecology of seashores**, CRC Press, 2001

D. Bertness et al, **Marine community ecology and conservation**, Second edition, Sunderland, Massachusetts : Sinauer Associates, 2014

Levinton J.S., **Marine Biology: function, biodiversity, ecology**, Oxford University Press, 2001

Rupert F.G. Ormond, John D. Gage, and Martin V. Angel, **Marine biodiversity : patterns and processes**, First Edition, Cambridge University Press, 1997

Raffaelli D.G., **Intertidal ecology**, Second edition, Chapman & Hall, 1999

Little, C. & Kitching, J.A, **The Biology of rocky shores**, Second edition, Oxford University, 2009

Adam, P., **Saltmarsh ecology**, Cambridge University press, 2010

Barreiro F., Gómez M., López J., Lastra M. & la Huz R., **Coupling between macroalgal inputs and nutrients outcrop in exposed sandy beaches**, *Hydrobiologia*, 700: 73-84, 2013

Vila-Concejo A. & Kench P.S., **Storms in Coral Reefs: Processes and Impacts**, *Coastal Storms*, pp.127-149, 2017

Ansell, A.D, Gibson, R.N., Barnes, M.,, **Oceanography and Marine Biology, An annual review**, Aberdeen University Press, 1995

Shing Yip Lee et al., **Ecological role and services of tropical mangrove ecosystems: a reassessment**, *Global Ecology and Biogeography* 23 , 726-743, 2014

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## Recommendations

### Subjects that are recommended to be taken simultaneously

Ocean Dynamics/V10G060V01702

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## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===

Teaching methodologies that are maintained

In the event of a health emergency, the contents of the theoretical teaching, practical teaching and seminars will be maintained.

\* Teaching methodologies that are modified:

In the event of a health emergency, theoretical teaching and seminars will be taught through a remote campus, maintaining the content and teaching objectives.

Field trips will be replaced by audiovisual content that will allow the acquisition of the planned content, and attempts will be made to carry them out in person / as soon as possible.

If the presence in the laboratories is impossible, the practices will be taught virtually through a remote campus analyzing case studies identical to those provided for in-person teaching.

Group work, which is usually based on data extracted from field or laboratory work, will become strictly bibliographic in the event of a health emergency.

\* Non-face-to-face service mechanism for students (tutorials)

The tutorials will be carried out through remote campus sessions agreed through email. Or simply through email.

\* Modifications (if applicable) of the content to be taught

There will be no changes in the teaching content.

\* Additional bibliography to facilitate self-learning

It will be attached, if necessary, depending on the conditions of the moment.

\* Other modifications

There is not

=== ADAPTATION OF THE EVALUATION ===

Theoretical Exam: [Previous weight 65%] [Proposed Weight 70%]

Public exhibition of group work: 15%

Written report of group work: 15%

\* Evidence that is modified

Laboratory practice evaluation will be part of the theoretical exam

\* New tests

There is not

\* Additional Information

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